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TECHNOLOGICAL EXPLORATION AND MARKET EXPLOITATION IN INTERFIRM ALLIANCES

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ABSTRACT

This paper empirically examines the dichotomous contribution for innovation, for technological exploration and market exploitation, from alliances. Using a sample from US economy-wide alliances of US Public companies and employing cross-tabulation of various classifications of alliances and parent firms, the related phenomena are investigated. Results show that alliances are predominantly undertaken by technology-intensive companies and their frequency has a direct association with the parental technological intensity. However, technological explorative purposes do not dominate in the complete sample of alliances. Many firms, whether technologically intensive or not, enter into alliances also for market exploitative purposes. This contingent phenomenon shows that alliances offer a very important additional role that is not all technology centered, but that is also deeply market centered.

JEL: L14, L24, M10, O31, O32

KEYWORDS: Exploration, Exploitation, Innovation, Ambidexterity, Alliances, Technological Intensity

INTRODUCTION

There appears to be near consensus in the scholarly literature about the central role of alliances in technological innovation. Innovation occurs when creatively spun technological knowledge is successful in the market. The locus for the effort, sometimes long and always winding, is usually dichotomized and contrasted for scholarly convenience into classes of activities for exploration (for invention) and exploitation. Alliances can help with the locus of innovation. The notion that interfirm alliances are strongly associated with technological intensity and innovation is accepted partly because of the fortuitously high frequency of alliances in high technology industries, which scholars have favored for their studies.

There are reasons, however, that the usual organizational processes, already strained with natural internal conflicts and external uncertainties, may be further challenged to the point of ineffectualness along a locus that involves alliances. Alliances bring difficult boundaries and undecipherable structures and processes of external organizations. The overarching research question in this paper is if and where along the locus do alliances contribute to innovation. We will also ask if the technological intensity of the parent firms has an effect on the role of alliances. These questions can be investigated by examining the characteristics of the parent firms in conjunction with purposes of the alliances formed.

The paper presents an inquiry into the role of alliances in innovation and their association with the technological intensity of firms. The next section of the paper provides the literature review. Based on that review, a set of hypotheses are presented next. Details of data collection, preparation and research method follow in the following sections. Results are then presented and explained. They are further discussed and interpreted in the section that follows. The concluding section gives the expected reach and consequences of the findings as well as the limitations of the study.

LITERATURE REVIEW

A body of scholarly work has strongly established the role of alliances in advancing technological innovation. (e.g. Lavie, Stettner, & Tushman, 2010; Whittington, Owen-Smith, & Powell, 2009; Zeng, Xie, & Tam, 2010) It is useful in this context to keep in mind the classical theoretical conceptualization of innovation, which rests on the notion that organizations mediate the historical progress of *technology* and *markets* (Allen, 1984; De Solla Price, 1963; Myers & Marquis, 1969; Toynbee, 1948). The definition of innovation as *invention* + *exploitation* arises from this conceptualization. Such a conceptualization has enabled the scholars to divide the organizational locus of innovation broadly into sequential components starting with R&D and ending with commercialization.

Within and across each of these components, the scholars looked for patterns and structures that strengthen innovation. Several scholarly efforts that examine the technology transfer processes fall in this genre (Allen, 1984; Clark & Fujimoto, 1991; Roberts, 1964; Rothwell et al., 1974; Sherwin & Isenson, 1967; SPRU, 1972; Van de Ven & Rogers, 1988; von Hippel, 1987). A few scholars examined also the effects of environmental variables on innovation, such as the stages in the life cycle or the complexity of a technology (Henderson & Clark, 1990; Tushman & Anderson, 1986; Utterback, 1974). However, most of these early scholarly approaches took a *unitary* perspective of organizations and generally assumed that organizations take on the task of bridging knowledge base and markets single-handedly.

To be fair, not all scholarship in innovation overlooked the interdependence among organizations. Some interdependencies were found to be extremely important, as represented in the notions of gatekeepers (Allen, 1984), lead users (von Hippel, 1987), and, interlocking directorates (Allen, 1974; Mintz & Schwartz, 1981; Pennings, 1980). There were also some discomforting issues such as employee turnover (Allen, 1984) and informal know-how trading (Schrader, 1989; von Hippel, 1987) that suggested "leakage" of knowledge across firms.

As interfirm alliances started to proliferate from the 1980s, their role in advancing innovation seemed all too obvious. The main thrust of the argument in support is that under conditions of increasing technological intensity, indicated by high technology-related expenses and consequent need for compensatory access to markets, it would be beneficial to form cooperative links that would help in hedging the bets on developmental investments, in bringing complementary technological skills and in providing market access. Alliance literature is now replete with studies that claim a positive association between alliance formation and technological intensity. (e.g. Badaracco Jr., 1991; Chesbrough & Teece, 1996; Hagedoorn, 1990; Hladik, 1985, 1988; Mowery, 1985, 1987; Pennings & Harianto, 1992; Van de Ven & Walker, 1984)

A very influential scholarly articulation of a parallel scholarly concept related to organizational learning, of exploration and exploitation (March, 1991), tuned out to be highly clarifying for innovation related processes. Although the scholars of innovation focused on aspects of 'invention' and 'exploitation,' they did so mostly from well-partitioned and separate bunkers. Although there was lip service for the need for better meshing between the inventive and exploitative activities in an organization, that was carried out more as a dutiful protest against the inevitable. March not only shed some new light on 'exploration of new possibilities,' essential for invention, and 'exploitation of old certainties,' essential for commercialization, but he also highlighted the stark trade-offs needed in each case to maintain the other.

Other scholars carried forward the work of balancing the trade-offs, and developed the theory and the empirical work around the requisite ambidexterity. (Andriopoulos & Lewis, 2009; Gupta, Smith, & Shalley, 2006; He & Wong, 2004; Raisch, Birkinshaw, Probst, & Tushman, 2009; Rothaermel & Alexandre, 2009; Simsek, 2009) The scholars of ambidexterity strongly and intuitively linked March's two concepts, which until then had been somewhat insulated due to the intrinsic contrasts between them.

The notion of alliances as aiding innovation has found new resurgence when viewed though the exploration-exploitation lens, although the classic conceptualization, earlier discussed, also could have quite sufficed. There are counter arguments to the point of view about alliances, arrived as above. Communication networks *within* organizations, and also within groups, are already too fragmented (Allen, 1984), integrative processes too over-extended (Roberts, 1987) and cultural chasms across groups too difficult to bridge (Katz, 1997) that significant managerial skills and efforts are still needed for mending and improving *internal* innovation processes, whether explorative or exploitative. It would seem that an *external* locus of innovation through alliances might only hinder the process. Additional organizational and geographical boundaries that interfirm alliances impose can only damage the process, if not thwart it entirely. The overwhelming failure rate of alliances (Chowdhury, 1992; Harrigan, 1985; Park & Russo, 1996; Shennan, 1992) could be one important clue related to this. Further, economic appropriability arguments (Basberg, 1987; Levin, Klevorick, Nelson, & Winter, 1987), particularly the protection of tacit knowledge (Polanyi, 1962, 1966; Reich & Mankin, 1986) do not favor the creation of formal cooperative links that might enable one partner to engage in opportunistic behavior detrimental to the other.

When considered comprehensively, the extant literature thus presents a somewhat conflicting picture. On the one hand, alliances can offer a promising locus for innovation and, on the other, the additional boundaries and other impedances might diminish and even annul the promise. The role of alliances for aiding innovation is usually assumed to be simply given, especially if the field of study where they are prevalent is also generally known for innovation (e.g. biotechnology and pharmaceutical industries, see: Gilsing & Nooteboom, 2006; Nielsen & Nielsen, 2009; Powell, Koput, & SmithDoerr, 1996; Rothaermel & Deeds, 2004; Whittington, et al., 2009). Whether alliances occur *in general* for companies with high technological (R&D) intensity, whether they offer unambiguous and direct locus of innovation, and, if so, whether predominantly for exploration, exploitation, or both, all are empirical questions not yet definitively answered. This paper seeks to find the answers by examining a random set of alliances, their purposes and their parents closely.

DATA AND METHODOLOGY

As we saw in the preceding review, technological innovation consists of activities whose goals may be broadly bifurcated into exploration (for inventions) *and* exploitation (for extracting rent from the market). For our purposes in this study, I will operationalize the former either as the intended creation of a new product or the modification of an existing product ("technological improvements"), and the latter as the intended creation of either a new or modified customer base ("new markets"). In order also to classify and to investigate alliances with either of these two purposes, the two variables will also be merged ("either technological improvements or market access"). Precise coding schemes follow in the next section.

Despite the consensus about the role of alliances in innovation, it is not completely clear where in the locus of innovation alliances provide most help. Due to the usually common high technological intensity of the parents of an alliance, it is sometimes implicitly assumed (e.g. Gilsing & Nooteboom, 2006; Hargadon & Sutton, 1997; Powell, et al., 1996) that alliances are more helpful in the explorative activities leading to inventions. The following two hypotheses are proposed to test the implied propensity for explorative functions in alliances and the likely influence of the technological intensity of parents on such propensity:

Hypothesis # 1 Creation of technological improvements is a predominant goal for alliances.

Hypothesis # 2 Higher the technological intensity of the parents, greater is the propensity to form alliances with the goal of creating technological improvements.

It is equally plausible, given the softer but remarkably widespread claims around the benefits of meshing of complimentary resources in alliances (e.g. Lockett, Murray, & Wright, 2002; Shipilov, Rowley, & Aharonson, 2006), that perhaps exploitative activities instead dominate alliances. To test the same and to check for the impact of parental technological intensity, the following two hypotheses are proposed:

Hypothesis # 3 Creation of market access is a predominant goal for alliances.

Hypothesis # 4 Higher the technological intensity of the parents, greater is the propensity to form alliances with the goal of creating market access.

Since *either* exploratory or exploitative functions in alliances can be crucial for innovation and since one of these two might indeed take place within organizational boundaries of a parent, the following two hypotheses are also proposed combining the four hypotheses above:

Hypothesis # 5 Creation of either technological improvements or market access is a predominant goal for alliances.

Hypothesis # 6 Higher the technological intensity of the parents, greater is the propensity to form alliances with the goal of creating either technological improvements or market access.

The main source of the data used in this paper is the Wall Street Journal (WSJ) *abstracts*. The WSJ abstracts were searched electronically for three key phrases: "joint venture," "license," and "alliance." A subset of abstracts containing the key phrases were then electronically filtered and parsed, with manual supervision for each record, to generate an *intermediate* dataset. The period covered was from January 1985 to December 1990. The raw data were collected over a period towards the end of the 1990s. Further data manipulations and processing were carried out in the 2000s and completed recently. Such techniques of extracting data from public domain sources for social science research is well established (Herman & Chomsky, 1988), and is now utilized even by major data vendors. (Standard & Poor, 2004; Thomson Reuters, 2013)

The source data from WSJ are *very* comprehensive and devoid of selection bias based on the type of industry or business segment. Further, alliances are included irrespective of their purpose (e.g. R&D, manufacturing, marketing, etc.). However, since WSJ attempts to publish all information that has relevance to the market value of the public firms in the US, the information is "centered" around those firms. Alliances of private firms appear in the WSJ only if the partner is a public firm. In other words, there is a selection bias against private firms in the source data.

For statistical and other analyses, a *base* alliance dataset was next created from the intermediate set by selecting only alliances by US public firms. This choice of public firms was made not just because of relative absence of selection bias of industry or segment, but also because the needed firm-level characteristic data are readily available only for them. The base dataset consisted of 7515 public US firms with 1435 relationships from 427 US industries. For the study reported in this paper, I selected, from the base dataset, a random sample (without replacement) of 109 alliances and information about their parents. Since we also need to examine carefully the purposes for which the alliances are used, full text announcements in the WSJ of the 109 alliances were also downloaded from the Dow Jones News Retrieval Database.

For each of the 109 alliances, I created four variables. The first three are based on subjective ratings derived from the full text announcements. Two graduate students independently rated the alliances based on schemata I will present shortly. It should be noted that the interrater agreement was 84.4% for the subjective ratings. In view of this remarkably high degree of agreement, revisiting the ratings for any further improvements was not deemed necessary. For all the analyses in this paper, the "first" rater's classifica-

tions are used. It is also worth noting that much of the 15.6% disagreement is likely to be due to random error. The fourth variable is based on a classification of the R&D intensity of the parent firms. The details of creating each variable follow.

Classification of Alliances Based on *Technological Improvements*

This variable operationalizes the construct about exploration (for inventions) as a binary variable indicating the presence or the absence of a declaration about technological improvement for the alliance. This was done in two steps. The raters were given the classification schema shown in Table 1. As shown in step 1, they would first classify each alliance using eight mutually exclusive and collectively exhaustive criteria. Products are created or modified in classes 1-5, and products are unchanged in classes 6-8. The criteria help put alliances into bins depending on whether or not the parents separately or collectively create a new product or modify an old one. If they do, criteria 1-5 would apply, and if they do not, 6-8 would. Each of the eight criteria would receive a binary assignment from the raters. As step 2, the binary variable, T_Explore, for use in our analyses was created by simply recoding the initial classification to indicate technological improvements or their absence in an alliance.

Table 1 - Classification of Alliances Based on Technological Improvements

STEP 1	According to the characteristics of the technological improvements involved in the alliance, each alliance was classified into one of the following: 1. Firms develop a new product together and market both "together" and/or separately" 2. One firm develops a new product and second firm markets 3. One firm develops new product • Second firm modifies and markets • Both firms help in modifying and second firm markets • Both firms help in modifying and both firms market 4. One firm provides existing product • Second firm modifies and markets • Both firms help in modifying and second firm markets • Both firms help in modifying and both firms market 5. Both firms supply existing products • Second firm modifies and markets • Both firms help in modifying and second firm markets • Both firms help in modifying and both firms market 6. Both firms supply existing products and either or both firms market without any modification 7. One firm provides an existing product and second firm markets 8. One firm produces existing product and second firm helps in selling it (e.g.: advertising help)
STEP 2	Based on the above classification, the final binary variable T_Explore was created to indicate technological improvements or their absence in an alliance.

Note: The steps given in the table were used to classify each alliance according to the technological explorations purposed in it. The first step created a detailed and fine-grained classification. That was converted in the second step to a binary classification indicating the presence of absence of technological exploration.

Classification of Alliances Based on *Access to New Markets*

This variable operationalizes the construct about (market) exploitation. The raters were provided a second schema, shown in step 1 of Table 2, to classify each alliance according to targeted markets. As in the previous case, the more comprehensive initial classification (from the first step) was recoded (in second step) to obtain a binary variable M_Exploit that simply indicates whether the alliance targeted new markets.

Combining the Technology and Market Based Classifications

In a third binary variable Explore_Exploit, I combine T_Explore and M_Exploit. If T_Explore indicates *absence* of technological improvements *and* M_Exploit indicate access to *no* new markets, Explore_Exploit would indicate *absence* of any discernible benefit to innovation processes from the alliance. Otherwise, it would indicate the *presence* of benefit for innovation from either or both of T_Explore and M_Exploit.

Table 2 - Classification of Alliances Based on Access to New Markets

STEP 1	As a result of an alliance, the target customer base for the product from it could be: 1. *Unchanged* E.g. two automobile companies enter into a joint venture so that one learns just-in-time manufacturing from the other. This classification applies if the new buyers are not in a different segment than before the venture. 2. *Modified* E.g. two automobile companies enter into a licensing arrangement so that one (which until the alliance made and sold only cars) learns to manufacture and sell, say, sport-utility vehicles (SUV) from the other. This classification applies if the company newly selling SUVs targets a customer base it did not have before the licensing arrangement. The new customers are different from car buyers, but not dramatically so. 3. *Entirely new* E.g. two computer companies enter into an alliance to produce, say, software tools for distance learning. This classification applies if customers are really new, and have little experience in using the new or similar products. For each parent and the alliance, the target customer base is to be classified as one of the above or unknown.
STEP 2	Based on the above classification, the final binary variable M_Exploit was created to show whether any new or modified market was targeted or not in an alliance.

Note: The steps given in the table were used to classify each alliance according to the market exploitations purposed in it. The first step created a detailed and fine-grained classification. That was converted in the second step to a binary classification indicating the presence of absence of market exploitation.

Classifying Alliances Based on the *R&D Intensity* of the Parents

In order to classify each alliance according to its two parents, first *each* parent needs to be classified. The parents were classified as follows. Using data from COMPUSTAT (Standard & Poor, 2004), a commercial database that carries various financial and related information, a variable *R&D intensity* was constructed as a fraction of average *R&D Expenses* over *Sales*. The averaging was done over the six years for which the alliance data were originally collected. The distribution of *R&D Intensity* (quartiles and outliers) for firms was used to code classes of the same as shown in Table 3. The levels are "Z," "S," "M," and "L," representing "Zero", "Small", "Medium", and "Large" of R&D Intensity. The alliances then were characterized by *literally* merging the levels of the two parents to obtain levels such as L2L, L2M, L2S, L2Z, M2M and so on. This new alliance-level variable is called P1toP2.XRD, a shortened version of Parent-to-Parent-R&D-Intensity.

Table 3 - Classifying Parent Firms Based on Their R&D Intensity

Levels in R&D Intensity	Levels Recoded to	Explanation for Acronym of Recode
Zero	Z	"Zero"
Quartile 1	S	"Small"
Quartile 2	M	"Medium"
Quartile 3	M	"Medium"
Quartile 4	L	"Large"
High Outliers	L	"Large"

Note: The parents of alliances were classified using the above scheme based on their respective R&D Intensity. R&D intensity was constructed as a fraction of average R&D Expenses over Sales. The levels in the first column were then computed statistically from the distribution of R&D intensity.

The hypotheses proposed earlier in the paper can be tested by examining the tabulations of appropriate classes of variables. Where two variables are involved each with multiple classes, as they are for Hypotheses 2, 4, and 6, *cross*-tabulations can be prepared and dependence between the variables can be stated with statistical confidence. For frequencies involving classes of just a single variable, as would be the case for Hypotheses 1, 3, and 5, only a descriptive comparative approach is available.

RESULTS AND DISCUSSION

The results of the analysis are given below. Since all the variables used in the analyses are categorical, it should be noted that the summary statistics, customary for continuous variables, are not available and not provided.

Technological Improvements through Alliances

Table 4 shows the extent to which alliances are used for creating technological improvements. The table indicates that a little more than half of all the alliances in the sample for US public companies are set up for this purpose. We would hold back judgment on whether creation of technological improvements, and therefore, exploration is the predominant goal until other comparable results are available. Next, in Table 5, we see how the alliances break out by the technology intensity of the parents (P1toP2.XRD). Alliances in which both parents have the highest technology intensity dominate (55%). If we consider alliances in which at least one parent has the highest intensity, they account for 77% of the total. Although this table does not correspond directly to any of our hypotheses, it is indicative of the influence of parental technological intensity.

Table 4 - Extent of Use of Alliances for Technological Improvements

Technological Improvements (T_Explore)	**Percent of Alliances**
Yes	51
No	49
Total	100
(n)	(105)

Note: The table shows that roughly half the alliances in the sample are used for technological improvements.

Table 5 - Classification and Frequency of Alliances According to the R&D Intensity of Parent Firms

Alliance Class by R&D Intensity of Parents (P1toP2.XRD)	**Percent of Alliances**
L2L (Both Parents have "Large" R&D Intensity)	55
L2M (One parent has "Large" and second "Medium")	5
L2Z (One parent has "Large" and second "Zero")	17
M2M (Both Parents have "Medium" R&D Intensity)	2
M2Z (One parent has "Medium" and second "Zero")	5
Z2Z (Both Parents have "Zero" R&D Intensity)	16
Total	100
(n)	(109)

Note: Classes of R&D intensity of the parents are shown in Table 3. The classes of two parents are concatenated to obtain the classification for an alliance, such as L2L, L2M, L2S, L2Z, M2M and so on. The table shows that 55% of the alliances have both parents with large R&D intensity and 77% of the alliances have at least one parent with large R&D intensity

I cross-tabulate, in Table 6, the above two variables to examine the extent of use of alliances for technological improvements as a function of the R&D intensity of parents. While technological improvements are seen in 62% of the alliances in which both parents have the highest R&D intensity, they are seen in only 12% of the alliances in which both parents have the lowest (Z2Z) R&D intensity. The diagnostic numbers ($\chi^2 = 19.14$ and $p = 0.002$) also indicate that the two variables T_Explore and P1toP2.XRD are not independent. This result, therefore, provides support for Hypothesis #2.

Table 6 - Extent of Use of Alliances for Technological Improvements as a Function of the R&D Intensity of Parents

Technological Improvements (T_Explore)	Percent of Alliances in Classes Determined by R&D Intensity of Parents (P1toP2.XRD)					
	L2L	L2M	L2Z	M2M	M2Z	Z2Z
Yes	62	75	44	0	83	12
No	38	25	56	100	17	88
Total	100	100	100	100	100	100
(n)	(58)	(4)	(18)	(2)	(6)	(17)
$\chi^2 = 19.14^{**}$, p = 0.0018						

Note: The diagnostic numbers suggest that parental R&D intensity and technological improvements are not independent and, therefore, are associated with each other. Although strict ordinality should not be assumed for P1toP2.XRD, a positive influence of parental R&D intensity with respect to technological improvements can be observed in the data.

Creation of Market Access through Alliances

Table 7 shows that nearly two-thirds of the alliances are set up with the purpose of opening new markets. Although this is a slightly bigger fraction than that for technological improvements, we will once again restrain from commenting whether this is the predominant goal until after all the relevant results have been presented. I cross-tabulate, in Table 8, the extent of use of alliances for market access (M_Exploit) as a function of the R&D intensity of parents (P1toP2.XRD). While new market access is expected in only about 50% of the alliances in which both parents have the highest R&D intensity, it is expected in 81% of the alliances in which both parents have the lowest (Z2Z) R&D intensity. However, the results show that ratios do not show a consistent pattern across the levels of R&D intensity of parents. The diagnostic numbers ($\chi^2 = 10.05$ and p = 0.07) fail to reject the independence between the two variables M_Exploit and P1toP2.XRD. This means that Hypothesis 4 is not supported.

Table 7 - Extent of Use of Alliances to Access New Markets

Access to New Markets (M_Exploit)	Percent of Alliances
Yes	64
No	36
Total	100
(n)	(105)

Note: The table shows that 64% of the alliances in the sample are used for accessing new markets.

Table 8 - Extent of Use of Alliances to Access New Markets as a Function of the R&D Intensity of Parents

Access to New Markets (M_Exploit)	Percent of Alliances in Classes Determined by R&D Intensity of Parents (P1toP2.XRD)					
	L2L	L2M	L2Z	M2M	M2Z	Z2Z
Yes	51	80	78	100	83	81
No	49	20	22	0	17	19
Total	100	100	100	100	100	100
(n)	(59)	(5)	(18)	(1)	(6)	(16)
$\chi^2 = 10.05$ ns, p = 0.0739						

Note: The diagnostic numbers suggest independence between parental R&D intensity and seeking of market access. The pattern of market access appears to trend similarly across levels of parental R&D intensity.

Overall for Innovation - Either Technological Improvements or Market Access through Alliances

We see in Table 9 that a large percent of alliances (82%) is set up with either purpose of technological improvements or access to new markets (Explore_Exploit). With reference to hypotheses 1, 3, and 5, it is now clear that, first, exploration and exploitation separately are used only in 51% and 65% of alliances respectively, and, second, either use (exploration *or* exploitation) is found in 82% of alliances. In other

words, firms employ alliances for innovation in a contingent manner, utilizing one or both of its dichotomous elements opportunistically.

The cross-tabulation of Explore_Exploit and P1toP2.XRD in Table 10 show that across differing technological intensities a pattern is fairly stable. The diagnostic numbers ($\chi^2 = 0.86$ and $p = 0.97$) fail to reject the null hypothesis of independence between the two variables. Hypothesis 6 is not supported.

Table 9 - Extent of Use of Alliances either for Technological Improvements or to Access New Markets

Technological Improvements or New Market Access (Explore_Exploit)	**Percent of Alliances**
Yes	82
No	18
Total	100
(n)	(104)

Note: The table shows that 82% of the alliances in the sample are used either for technological improvements or to access new markets.

Table 10 - Extent of Use of Alliances either for Technological Improvements or to Access New Markets as a Function of the R&D Intensity of Parents

Technological Improvements or New Market Access (Explore_Exploit)	**Percent of Alliances in Classes Determined by R&D Intensity of Parents (P1toP2.XRD)**					
	L2L	**L2M**	**L2Z**	**M2M**	**M2Z**	**Z2Z**
Yes	79	80	83	100	83	88
No	21	20	17	0	17	12
Total	100	100	100	100	100	100
(n)	(58)	(5)	(18)	(1)	(6)	(16)
$\chi^2 = 0.86$ ns, $p = 0.9731$						

Note: The diagnostic numbers suggest independence between parental R&D intensity and Explore_Exploit. The trend appears to be fairly similarly across levels of parental R&D intensity.

In summary, we closely examined a set of sample alliances by US public companies to understand their role either for creating technological improvements ("exploration") or for creating access to new markets ("exploitation"). We also examined these roles as a function of the R&D Intensity of the parents of an alliance. There are several important observations to be made based on the alliance level analyses. Tables 4, 7 and 9 show that (i) technological improvements is the least frequent purpose (51%) in our sample, (ii) access to new markets is bit more prevalent (64%), and, (iii) *either* of the two is the most dominant purpose (82%). The finding that technological improvement is *not* a predominant goal in alliances is a very important one in this paper.

Tables 5 shows that more than 50% of the alliances have *both* parents with large ("L") R&D intensity, and about 80% of the alliances have *at least one* parent with large R&D intensity. Notwithstanding other nuances uncovered in the results, this shows that alliances are observed largely around technology-intensive firms. We also know from the statistically significant pattern in Table 6 that there is a direct relationship between R&D Intensity and seeking of technological improvements through alliances. This association between the variables is another important finding in this study.

We also uncovered in Tables 8 and 10 that neither market access nor general innovation seeking (that is, the goal of *either* market access or technological improvement) has any statistically discernible relationship to technological intensity of parent firms. In conjunction with the earlier results, the implication of this study are that, overall, *irrespective* of their technological intensity firms mostly use alliances contingently either for explorations or for exploitation and that technology intensive firms use them a bit more for explorations.

CONCLUDING COMMENTS

A major contribution of the paper is the added insight from the in-depth examination of alliances as they relate to the dichotomous elements of innovation - exploration and exploitation. This allows us to corroborate some parts of scholarly consensus and to discount others. On the one hand, technology-intensive companies predominantly undertake alliances and their frequency has a direct association with the parental technological intensity. On the other hand, technological explorative purposes do not dominate in alliances. Firms, whether technologically intensive or not, and many are not, also enter into alliances for market exploitative purposes. This contingent phenomenon shows that alliances offer a very important additional role that is not all technology centered, but that is also deeply market centered. Although the idea of matching complimentary resource in alliances may provide a general umbrella for the latter concept, our analyses go one-step further and give direct evidentiary proof for the importance of exploiting markets through alliances.

For the literature of learning around exploration and exploitation, the above observation has additional implications. It is well accepted that balancing the somewhat orthogonal processes of exploration and exploitation - that is, being ambidextrous about both - in an organization is a great challenge. (Dunlap-Hinkler, Kotabe, & Mudambi, 2010; Kaplan & Henderson, 2005; O'Reilly & Tushman, 2004) As we see in the paper, when technological competence or market access is lacking, an alliance can sensibly bridge the chasm quickly. That might even obviate the need for developing and maintaining the difficult internal ambidexterity. In short, alliances can offer a locus of innovation that is not limited by the constraints of the internal structures and processes of an organization.

In considering the above contributions, some limitations of the study should be kept in mind. Although the work is safely generalizable for US public companies for the foreseeable future, absence of alliances by private companies in the data is an important limitation. Further, the inferences in the paper were made using classified data. More fine-grained data are now available about alliances. These would permit a more thorough unpacking of the characteristics of alliances. Additional analytical techniques also would become plausible with data that are more comprehensive. It is also important not to lose sight of the fact that classifications for exploration and exploitation are based on the *alliance* itself.

It is possible that a given technological breakthrough takes place *within* a parent firm and an alliance just serves as a conduit to take it to certain pre-existing customer base. This study did not have the information on the source technologies. It would be ideal if the full locus of a sample of technological inventions to the markets can be tracked. There appears to be considerable promise for future work around such a design. Patterns of choices for the locus, whether it is fully or only partially contained within organizations, types of compromises for ambidexterity, between exploration and exploitation within as well as across organizations, and the performance impact from them for alliances would all be of great scholarly interest.

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SERVICE CHAIN COORDINATION USING SALVAGE MANIPULATION

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ABSTRACT

This paper introduces a new coordinating mechanism for a two-echelon service chain with a single service retailer and multiple suppliers. The retailer sells a bundled product with perishable demand to the end customer. Prior to the selling season, suppliers must make components available to the retailer, and the retailer must acquire capacity. The bundled components consist of service capacity at the retailer and products from the suppliers. We demonstrate our salvage manipulation mechanism using an example of a travel agency that provides vacation packages using components provided by suppliers in a service chain. Our mechanism is simple to calculate and does not require the use of burdensome revenue-sharing contracts.

JEL: C61, D21, L11, L81

KEYWORDS: Service Chain, Coordination, Newsvendor, Exogenous Pricing

INTRODUCTION

Retailers in the service industry may sell a combination of tangible and intangible items. For example, in a restaurant, the intangible capacities of the server and the chef are combined with the tangible components of a steak and a glass of wine. In a service chain, when all these elements need to exist in concert to provide a complete customer experience, the quantities of each need to be coordinated. If the package or bundle to be provided by the retailer consists of an item that has a short life cycle, this problem can be modeled as a single-period newsvendor problem. Tangible items may be sold at a reduced price after the selling season ends (or may require a disposal fee). However, if the components are intangible/perishable (e.g., unused seats on an airplane), then salvage value may be zero. Each firm in the service chain will want to balance its own costs of having too much capacity or goods on hand with the amount of lost profit due to having too little capacity or goods on hand. If the retailer and all component suppliers were owned by a single firm, that firm would choose the stocking quantity (capacity and components) to maximize the expected profit of the entire service chain. However, with different owners, each company is likely to optimize locally, potentially resulting in a lower expected profit for the entire service chain.

The rest of this paper is organized as follows. In the next section, we review the literature on coordinating manufacturing supply chains and service chains. After that, we discuss the model and the notation for the service chain examined in this paper. Then, we analyze centralized versus decentralized service chain operation and discuss the use of salvage manipulation to coordinate the decentralized service chain. Finally, we discuss the results and present conclusions.

LITERATURE REVIEW

Due to the presence of many stakeholders, each with its own localized objectives, service chains are difficult to manage. Fugate, Sahin, and Mentzer (2006) noted that often in business, each participant attempts to optimize locally without considering the entire service chain. A centralized decision maker could optimize the profits for the service chain, but many participants would be unwilling to give up control. As a result, many of these service chains operate in a decentralized manner, which results in a significant loss in overall efficiency, even with full information available to all participants. To overcome this inefficiency, it is necessary to identify mechanisms that give the participants control over their local entities and, simultaneously, enable them to make decisions that achieve the centralized efficiency. As noted in Lau, Lau, and Wang (2007), a manufacturer/retailer channel has difficulties in fully realizing the profit potential of the market.

Spengler (1950) referred to this inefficiency as double marginalization. To eliminate double marginalization, Pasternack (1985) proposed a coordination mechanism that provides partial credit to the retailer for unsold goods. Since then, a number of authors have identified other contracts to achieve coordination in supply chains. Examples include buy-back contracts (He, Chin, & Zhu, 2006), revenue-sharing contracts (Cachon & Lariviere, 2005; Dana & Spier, 2001), and mid-term returns (Taylor, 2001). All of these contracts were developed assuming a two-stage serial system (similar to the one described in Bollapragada, Rao, & Zhang, 2004) as the basic service chain setting.

There is a dearth of literature related to service industry coordination, although supply chain literature can be modified by adding assumptions for perishable service capacity instead of inventory on hand. The extant Assemble-To-Order (ATO) coordination literature was used for our service coordination model. Gerchak and Wang (2004) argued that a revenue-sharing contract alone does not coordinate an ATO service chain. They proposed a subsidy mechanism by which the retailer helps the two suppliers with excess inventory at their locations by partially paying suppliers for unsold delivered components. In their system, the retailer does not face any uncertainty and is a market price taker, while the suppliers set the prices of their components. Bernstein and DeCroix (2006) analyzed a three-player ATO supply chain in a multi-period setting and established the effectiveness of a mechanism in which subsidies flow from the retailer to the suppliers, and transfer payments flow from the suppliers to the retailer.

Our paper extends the existing literature on coordination contracts from ATO supply chains to the service industry where all prices are exogenous and revenue sharing is not necessary by design. All of the participants make their decisions simultaneously before the selling season. We model a service chain for which the retailer faces uncertainty and must make a capacity acquisition decision at the same time that the suppliers must make their component quantity availability decisions. If the retailer has sufficient bundling capacity, there is an insignificant lead-time to create the final vacation packages upon demand realization (similar to the assumption in Wang and Gerchak, 2003)—their mechanism coordinates with a non-zero revenue-sharing arrangement and a subsidy. Given the high administrative burden of a revenue-sharing contract (Cachon & Lariviere, 2005) and the ability of retailers to "cheat" (Wang, Jiang, & Shen, 2004), we provide a method that does not require revenue sharing to coordinate the service chain.

For this type of service chain to achieve coordination, we propose using salvage manipulation that requires the higher ratio service chain participants (as defined by cost of underage divided by cost of overage) to support the lower ratio participants by promising additional salvage value for their leftover inventories (unutilized capacity in the case of a service provider). We provide a simple computational mechanism (by solving a set of simultaneous linear equations) to obtain the exact magnitudes of the salvage manipulation among participants in the service chain.

MODEL AND NOTATION

We investigate a service chain with a single retailer (assembler) that provides a finished package upon realized customer demand. Participants in the service chain know only the demand distribution when making the quantity allocation decisions (at the suppliers) and the capacity acquisition decision (at the retailer) prior to the selling season. The actual value of demand is unknown until it occurs. The components (without loss of generality equal to one each) from n suppliers comprise the package sold by the retailer (possibly including material and labor from the retailer). The components in the service chain have a single selling period and must be salvaged (potentially at zero value) at the end of the season. Although at first the single period assumption appears to be very restrictive, it is valid for many products that have a well-defined selling season, such as vacation travel packages and holiday spa packages. We assume that the retailer sells a single package to consumers at a fixed market price (exogenously specified) for a single selling season.

Sequence of Events

In our model, the sequence of events for the service chain participants is as follows:

Before the selling season:

1. All participants view the forecasted demand distribution.
2. The retailer decides how much capacity to provide, i.e., the number of packages to bundle, and then acquires that amount of capacity.
3. Each supplier determines its component quantity allocation for the retailer and makes those components available to the retailer.

During the selling season:

4. Actual end customer demand x occurs at the retailer, i.e., the retailer sells finished good packages to customers.
5. If there are any salvage values, the suppliers and the retailer recoup those.

Model Assumptions

We assume that the production costs, selling prices, and salvage values for all of the components and the final package are exogenous and known to all participants in the service chain. Similarly, prior to the selling season, all participants in the service chain know the parameters of customer demand distribution. This is similar to Moon and Silver (2000), where they solved a multi-item newsvendor problem assuming known end item demand. However, they imposed a total acquisition budget, whereas we assume consigned inventory. We further assume that for each of the suppliers, the selling price per unit that a supplier charges the retailer must be greater than the supplier's unit cost to ensure a positive profit margin for the supplier. In addition, all participants know the costs of each other. Complete information regarding supplier costs is not unheard of in world-class firms. Anecdotally, the Vice President of Supply Chain, Direct Supply, Inc. notes, "[Our personnel] track most/all relevant raw materials and have experts on staff who have a good handle on what goes into a supplier's product cost" (Email from Brian Rouse, personal communication, April 3, 2012).

Further, we assume that the suppliers of the package components participate in vendor-managed inventory (VMI). Because the suppliers manage the stock levels in the case of any tangible components, the suppliers will know the amount used by the retailer, thereby eliminating the opportunity for the retailer to report a lower number artificially.

Model Notation

The following notation is used in the model:

- i Index, for the suppliers ($i = 1, \ldots, n$), for the retailer ($i = 0$).
- x Random variable for final product (vacation package) demand from end customers.
- μ Mean of demand x.
- q_i The quantity of the component that supplier i ($i = 1, ..., n$) makes available, and the number of packages bundled by the retailer ($i = 0$).
- m The minimum quantity available from all suppliers and the retailer, i.e., the minimum of q_i, $i = 0, ..., n$.
- p The selling price per unit (vacation package) to the end customer.
- c_i The cost of one unit at supplier i ($i = 1, ..., n$), and the cost of assembling and selling one package at the retailer ($i = 0$).
- w_i The selling price of one component from supplier i to the retailer.
- s_i The salvage value of one unsold unit at supplier i ($i = 1, \ldots, n$), and the salvage value of one unsold unit at the retailer ($i = 0$). This term is included for completeness only; salvage value is zero in many service environments.
- δ_i The salvage manipulation per unit between the retailer and each supplier i (i = 1, ..., n).

Based on our discussion above, all of the costs must be non-negative and must satisfy the following conditions to make sense in a business context:

$$p > w_i > c_i > 0 \tag{1}$$

The retailer must stand to make a profit above its capacity acquisition cost plus the supplier components' costs to remain in business.

$$p > \left[c_0 + \sum_{i=1}^{n} w_i \right] \tag{2}$$

CENTRALIZED VS. DECENTRALIZED SERVICE CHAIN OPERATION

In this section, we determine the optimal inventory control policies when this service chain operates under both centralized control and decentralized control. First, we explain the centralized control operation scenario.

Centralized Control Operation

Solving the centralized setting enables us to determine the maximum expected service chain profit, which we use as a baseline for evaluating the performance of the decentralized service chain. The retailer decides on the quantity of each component and the equivalent bundling capacity to create a set number of finished units the customer may buy.

Proposition 1: The total service chain maximizes profit only when all participants select the same quantity. Proof: By contradiction, assume that $\{q_0, q_1, \ldots, q_n\}$ with $q_i \neq q_j$, for some pair i, j is an optimal solution. Let m be the minimum of $\{q_0, q_1, \ldots, q_n\}$. Consider an alternate solution where every participant in the service chain acquired only m units. The revenues associated with this new solution would equal the revenues associated with the original solution. However, the costs associated with the new solution would be lower

than those in the original solution would be. Thus, either (i) the solution in which every participant orders *m* units is an alternate optimal solution; or (ii) the original solution was not optimal, implying a contradiction.

The total expected profit of the centralized service chain $E[\Pi_C]$ is computed as:

$$E[\Pi_C] = -q_c \sum_{i=0}^{n} c_i + \int_{-\infty}^{q_c} \left(\sum_{i=0}^{n} s_i (q_c - x) + px \right) f(x)dx + pq_c \int_{q_c}^{\infty} f(x)dx \quad (3)$$

The first term in (3) represents the component costs and the capacity acquisition cost at the retailer. In the second term in (3) within the parentheses, the brackets house the capacity and component salvage value, and the last term within the parentheses is the retailer's revenue when demand is less than q_c. The final term in (3) represents the retailer's revenue when demand is greater than or equal to q_c. We take the first derivative of (3) with respect to q_c and set it to zero to give the critical fractile shown below, where q_c^* is the optimal order quantity for the centralized system and $F(q_c^*)$ is its corresponding cumulative distribution function (CDF) of demand.

$$F(q_c^*) = \frac{p - \sum_{i=0}^{n} c_i}{p - \sum_{i=0}^{n} s_i} \quad (4)$$

The ratio in (4) is always less than 1.0 given the conditions in (1). The second derivative of (4) is negative, indicating a concave profit function.

As an illustration of a service chain, in Figure 1 we model a travel agency (a retailer that bundles vacation packages) by working with three component suppliers that it owns—an airline, a hotel chain, and a rental car company. This travel agency must acquire capacity to bundle and sell vacation packages prior to actual demand realization. The three suppliers provide perishable components for the vacation packages. Because the airline cannot sell an unused airline seat on a flight the next day, we set salvage values for components and unutilized retailer capacity to zero in this example.

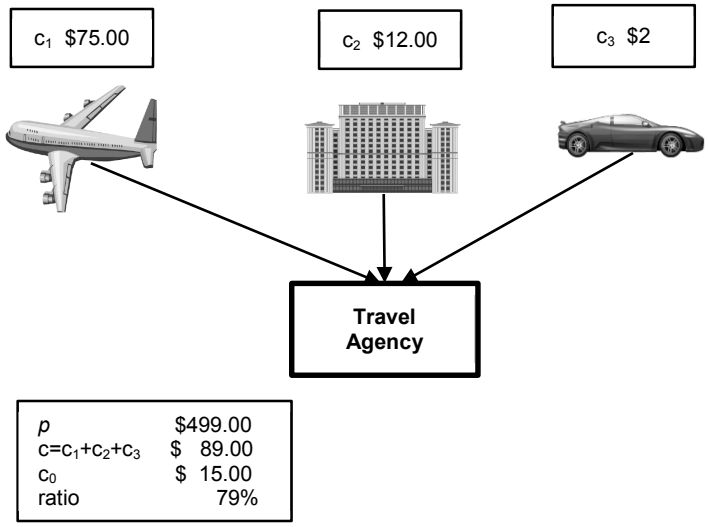
For this service chain, if demand were distributed uniformly between 0 and 100, using (4) would provide a critical fractile ratio of 0.80 and q_c^* = 80 [(100 – 0) * 0.80]. Using (3), the total expected profit would be $15,592.72, given the values for *p* and c_i as shown in Figure 1. Similar results come from analyzing normal and exponential demand distributions, but we used a uniform distribution here because of its simplicity—this should enable other researchers to replicate our results quickly.

In the expected profit function in (3), we used the subscript *C* to denote centralized control. Later in the paper, we use the subscripts *D* to denote decentralized control and *M* to denote the use of decentralized control combined with salvage manipulation. It is interesting to note that, as shown in Benzion, Cohen, and Shavit (2010), knowing the demand distribution does not lead participants necessarily to make decisions that improve profits. It might be that knowledge of the exact shape of the customer demand distribution is less important than prior research suggests.

We now look at the case where all component suppliers and the retailer act independently to maximize their local profits without implicit or explicit agreements between them. We assume the same service chain as

in the centralized control case, but now the travel agency does not own or control the suppliers, i.e., we assume a small travel agency that wants to provide vacation packages to its customers using components from Delta Airlines, Marriott Hotels, and Hertz rental cars. The retailer's objective is to maximize its profit by selecting the capacity to acquire (q_0), with known values for all other variables except the amount of demand.

Figure 1: Service Chain – Centralized Control



At the top of this figure are each supplier's cost per unit. At the bottom of this figure are the selling price per unit to the end customer, the combined cost per unit for supplier components, the cost of assembling and selling one unit at the retailer, and the calculated critical fractile ratio for the retailer.

The expected profit for the retailer is:

$$E[\Pi_0] = -q_0 c_0 + \left(p - \sum_{i=1}^{n} w_i \right) \int_{-\infty}^{q_0} x f(x) dx + \left(p - \sum_{i=1}^{n} w_i \right) q_0 \int_{q_0}^{\infty} f(x) dx + s_0 \int_{-\infty}^{q_0} (q_0 - x) f(x) dx \tag{5}$$

Taking the first derivative of the profit function above with respect to q_0 and setting the result to zero allows us to solve for the retailer's critical fractile; hence, the optimal capacity q_0^* to maximize the retailer's expected profit equals:

$$F(q_0^*) = \frac{p - \sum_{i=1}^{n} w_i - c_0}{p - \sum_{i=1}^{n} w_i - s_0} \tag{6}$$

Because $w_i > c_i > s_i$, from the assumptions in (1) and (2), the ratio in (6) may be more or less than the ratio in (4). That is, depending on the values of the parameters, the retailer may have a higher or a lower ratio under decentralized control than under centralized control.

In addition, the suppliers need to determine their allocation quantities prior to the retailer's selling season. However, the retailer will pay for the units it needs only after the demand for customer vacation packages, i.e., supplier components are consigned. A supplier may receive a salvage value $(s_i < c_i)$ for each unsold

unit at the end of the selling season (e.g., in addition to a hotel room, if a welcome fruit basket is part of the package and the fruit can be sold after the selling season at a reduced price). Assuming that the retailer has sufficient capacity to use any quantity that each supplier makes available, supplier *i*'s expected profit is:

$$E[\Pi_i] = -q_i c_i + w_i \int_{-\infty}^{q_i} x f(x)dx + s_i \int_{-\infty}^{q_i} (q_i - x) f(x)dx + w_i q_i \int_{q_i}^{\infty} f(x)dx \quad (7)$$

Taking the first derivative of (7) with respect to q_i and setting the result equal to zero allows us to solve for the supplier's critical fractile; hence, the optimal production quantity q_i^* for each supplier in the decentralized situation is calculated as:

$$F(q_i^*) = \frac{w_i - c_i}{w_i - s_i} \quad (8)$$

Providing that the retailer makes its quantity decision q_0^* based on (6) and that each supplier makes its quantity decision q_i^* based on (8), the quantity of complete packages that the retailer can bundle and sell will be the minimum of those two values, denoted as *m*. The total expected profit for the decentralized service chain is:

$$E[\Pi_D] = -\sum_{i=0}^{n} mc_i + p\int_{-\infty}^{m} x f(x)dx + pm\int_{m}^{\infty} f(x)dx + \sum_{i=0}^{n} s_i \left(\int_{-\infty}^{\infty} (m - x) f(x)dx + \int_{m}^{\infty} (x - m) f(x)dx \right) \quad (9)$$

Decentralized Control Operation

Figure 2 shows the same service chain as in Figure 1, but under decentralized control. The retailer has a ratio of 93% (determined using (6)), which is higher than the ratios of all of the suppliers. The suppliers' ratios are determined using (8). The retailer's quantity, given a *U* [0, 100] demand distribution, equals 93. The quantities for the suppliers equal 55, 85, and 95, respectively. Therefore, this travel agency would like to acquire capacity to bundle and sell more packages than is optimal (79). Notice that the airline supplier has a localized ratio of 55%; thus, it is the limiting factor in this service chain. The other suppliers need not make extra components available beyond the number of seats made available by the airline (55).

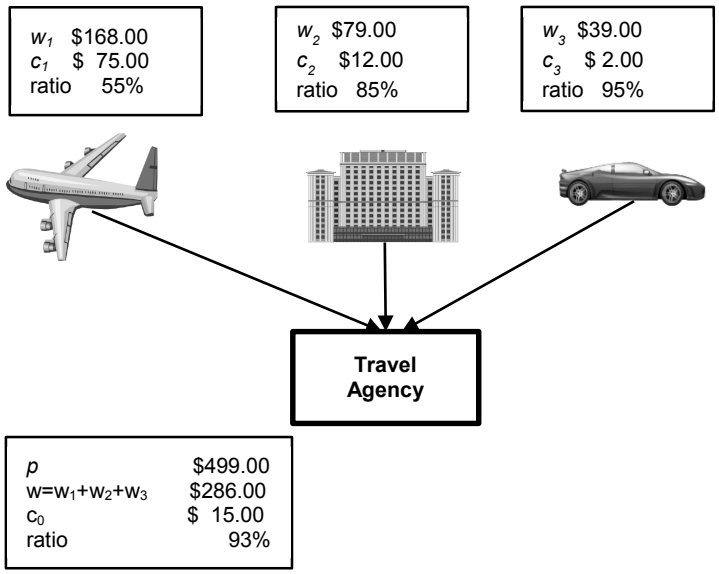
Given uniform demand [0,100], total service chain profit calculated with (9) = *E[Π]* = $14,116.50. This expected profit assumes that each participant is rational and will maximize its expected profit with full knowledge of the other participants' costs (as done in Cachon and Lariviere, 2001). If each participant makes available a quantity corresponding to its ratio rather than on a *q* based on the lowest ratio of all participants, expected profit is lower because there will be unmatched components/capacity—this would increase cost, but not potential sales of packages. By assuming common knowledge of cost parameters, we estimate a lower bound on the performance of the salvage manipulation mechanism (explained below).

Proposition 2: The expected profit under decentralized control will be lower than the expected profit under centralized control if the localized participant ratios are not equivalent.

Proof: It is well understood that either (i) all of the localized critical fractiles (ratios) are equal to the centralized critical fractile; or (ii) one or more of the localized critical fractiles is lower than the centralized critical fractile. This leads to the observation that *m* must be lower than q_0. Because the expected profit

function is concave and its maximum occurs at q_0, the decentralized service chain must have lower profits than the centralized service chain when $m < q_0$.

Figure 2: Service Chain – Decentralized Control



At the top of this figure are each supplier's selling price per unit to the retailer, cost per unit, and critical fractile ratio. At the bottom of this figure are the selling price per unit to the end customer, the combined selling price per unit to the retailer, the cost of assembling and selling one unit at the retailer, and the calculated critical fractile ratio for the retailer.

Decentralized Control Operation Coordinated Using Salvage Manipulation

It is not realistic to assume that complete vertical integration is possible or even desirable in all service chains. If a single entity owned and controlled the complete service chain, coordination would not be necessary. More commonly, all participants would remain decentralized decision makers, each with its local profit function. However, as shown above, the expected profit under decentralized control always will be lower than the expected profit under centralized control. It would be desirable to have a mechanism that enables all of the decision makers to optimize their local expected profit functions, yet make decisions that lead to increased service chain profits. This is the concept of service chain coordination, and we achieve that here with a method we call salvage manipulation.

Prior research has used a combination of subsidies and revenue sharing to motivate individual decentralized participants to select the same quantity (required for optimal profit per Proposition 1). To overcome the deficiency of revenue sharing, researchers such as Gerchak and Wang (2004) added a subsidy. However, using revenue sharing and a subsidy as two dependent levers is more complex than using a single mechanism only. Additionally, revenue sharing has the previously noted issues of cheating and high administrative burden. We propose a salvage manipulation mechanism (i.e., a salvage manipulator) as a form of subsidy between each retailer/supplier pair such that each participant will set its quantity to the optimal quantity of the centralized service chain, thus always obtaining the optimal expected service chain profit. Our method is simple to understand and use. We believe it is practical because it uses a single parameter (i.e., a salvage manipulator) and avoids using revenue sharing.

In effect, service chain participants desiring higher inventory and capacity available for potential customer sales would promise salvage manipulation to those participants desiring lower quantities. By doing so, all participants in the decentralized setting may improve their expected profit. Let us denote by δ_i the additional salvage value that the retailer promises to supplier i for the leftover inventory at its location. Notice that δ_i

can be either positive or negative. If it were negative, the retailer would want to select a capacity quantity higher than the corresponding amount of components that supplier *i* would want to provide; and if it were positive, the converse would be true.

Under decentralized control coordinated with salvage manipulation, the expected profit for supplier *i* is:

$$E[\Pi_i] = -q_i c_i + w_i \int_{-\infty}^{q_i} x f(x)dx + (s_i + \delta_i) \int_{-\infty}^{q_i} (q_i - x) f(x)dx + w_i q_i \int_{q_i}^{\infty} f(x)dx \tag{10}$$

To determine the maximum profit, we take the first derivative of (10) with respect to q_i and set it equal to zero:

$$\frac{\partial E[\Pi_i]}{\partial q_i} = -c_i + (s_i + \delta_i) F(q_i) + w_i (1 - F(q_i)) = 0 \tag{11}$$

This gives us the critical fractile on the left hand side of the equation below, which we set equal to the critical fractile that was calculated as optimal in (4) for the centralized scenario.

$$\frac{w_i - c_i}{w_i - s_i - \delta_i} = \frac{p - \sum_{i=0}^{n} c_i}{p - \sum_{i=0}^{n} s_i} \tag{12}$$

Then, we re-arrange (12) to solve for the salvage manipulator (δ_i) for each retailer/supplier contract as shown below:

$$\delta_i = \frac{-c_i p - s_i \sum_{i=0}^{n} c_i + p s_i + c_i \sum_{i=0}^{n} s_i + w_i \sum_{i=0}^{n} c_i - w_i \sum_{i=0}^{n} s_i}{\sum_{i=0}^{n} c_i - p} \tag{13}$$

Note that in our assumptions, the retailer's selling price (p) has to be greater than the capacity acquisition cost plus the sum of supplier wholesale prices so that the retailer makes a profit on each unit sold. Because the component price is greater than the cost per unit for each supplier, the denominator of the above equation must be greater than zero. Therefore, the salvage manipulator always would be defined.

The expected profit for the retailer, where *m* is the chosen quantity, is:

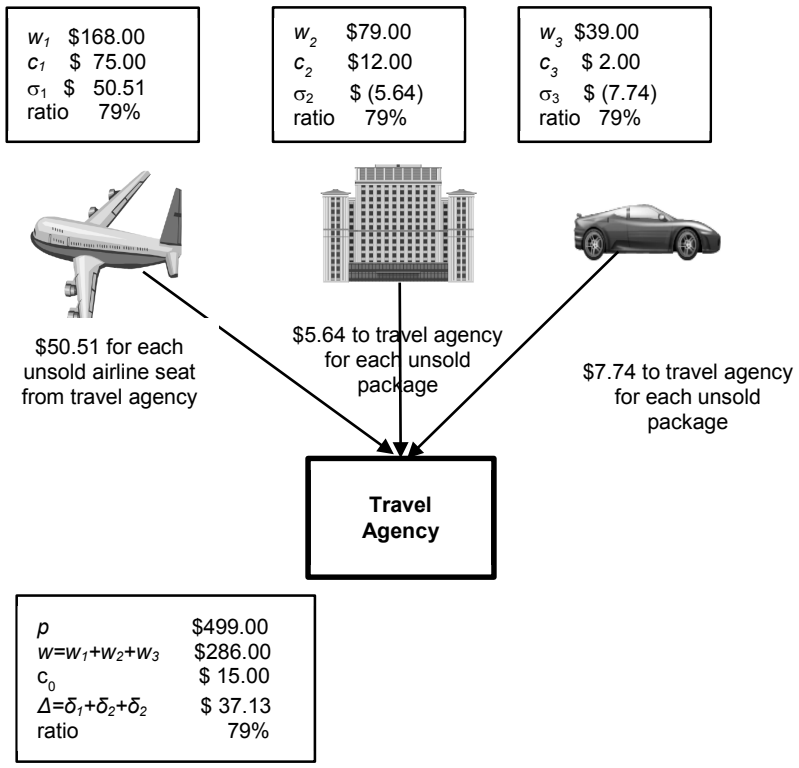
$$E[\Pi_0] = -mc_0 + \left(p - \sum_{i=1}^{n} w_i \right) \int_{-\infty}^{m} x f(x)dx + \left(s_0 - \sum_{i=1}^{n} \delta_i \right) \int_{-\infty}^{m} (m - x) f(x)dx + \left(p - \sum_{i=1}^{n} w_i \right) m \int_{m}^{\infty} f(x)dx \tag{14}$$

Proposition 3: $E[\Pi_M] = E[\Pi_C]$. The proposed salvage manipulation mechanism coordinates the decentralized service chain.

Proof: The *n* salvage manipulators are designed to produce the same critical fractile (ratio) at each supplier and the retailer as found in the centralized control case. Therefore, if salvage manipulation is used, the

quantities selected by all participants equal q_C from the centralized case and ensure that the service chain expected profit is equal to the service chain expected profit under centralized control.

Figure 3: Service Chain Coordinated Using Salvage Manipulation



At the top of this figure are each supplier's selling price per unit to the retailer, cost per unit, salvage manipulation per unit, and critical fractile ratio. At the bottom of this figure are the selling price per unit to the end customer, the combined selling price per unit to the retailer, the cost of assembling and selling one unit at the retailer, the net effect of salvage manipulation per unit promised by the retailer, and the critical fractile ratio for the retailer.

Given uniform demand [0, 100], total service chain expected profit = $E[\Pi]$ = $15,592.72 using salvage manipulation, and the optimal number of packages to sell equals 79. The expected profit using salvage manipulation is identical to the profit under centralized control. The salvage manipulation would work as follows:

Those service chain participants below the optimal ratio of 79% of the cumulative expected demand will receive a promise of salvage manipulation from those participants above the optimal ratio. Recall that in Figure 2 the retailer had a ratio of 93%, and the suppliers had ratios of 55%, 85% and 95%, respectively. Because the retailer wants more airline seats to be made available (79) than the airline normally would choose to make available (55), it offers the airline a promise of additional salvage for any unsold units (seats) at the end of the selling season. For example, the retailer would offer a promise, in the form of salvage manipulation, of $50.51 per unit to supplier 1 (airline) for each unsold airline seat, which would induce that supplier to make available a quantity that is 24 units more than it would otherwise (79 – 55). On the other hand, the ratios for the hotel chain supplier and the car rental company are above the optimal ratio. The hotel chain supplier would offer the retailer a promise of $5.64 per unit for unsold packages, which, in turn, then would flow to the airline if the cumulative expected demand were below 79 packages. The car rental company would offer the retailer a promise of $7.74 per unit for unsold packages, which, in turn, then would flow to the airline if the cumulative expected demand were less than 79 packages. In this

manner, the travel agency coordinates the flow of salvage manipulation funds among all participants in the service chain. The net effect to the retailer would equal \$50.51 - \$5.64 - \$7.74 = \$37.13 promised per unsold vacation package to the airline.

This salvage manipulation promise allows each decentralized participant to achieve the same quantity locally (under decentralized decision-making) that would have been selected globally (under centralized decision-making) if a single firm owned all participants. Any firm that has a locally higher ratio than the optimal centralized ratio promises salvage manipulation to those firms with ratios lower than the optimal centralized ratio. This salvage manipulation flows through the retailer as the touch point. Table 1 demonstrates how our coordination mechanism optimizes the decentralized control service chain with the three suppliers.

Table 1: Centralized, Decentralized, and Decentralized Coordinated with Salvage Manipulation Profits

	Centralized Control		Decentralized Control with No Coordination		Decentralized Control Coordinated Using Salvage Manipulation		Transfer Payment	
	Ratio	**Profit**	**Profit**	**%**	**Profit**	**%**	**Amount**	**Profit**
Retailer	79%	\$15,592.72	\$ 7,642.28	54%	\$ 7,816.10	50%	\$625.37	\$ 8,441.47
Airline			\$ 2,553.42	18%	\$ 3,671.20	24%	\$(850.76)	\$ 2,820.44
Hotel			\$ 2,480.45	18%	\$ 2,644.84	17%	\$ 95.00	\$ 2,739.84
Rental Car			\$ 1,440.35	10%	\$ 1,460.58	9%	\$ 130.39	\$ 1,590.97
Total		**\$15,592.72**	**\$14,116.50**	**100%**	**\$15,592.72**	**100%**		**\$15,592.72**

This table shows the optimal ratio and the expected profit for the service chain in the Centralized Control columns. The Decentralized Control with No Coordination columns show the expected profit for each participant, the total expected profit for the service chain, and the percent of total expected profit for each participant. The Decentralized Control Coordinated Using Salvage Manipulation columns show the expected profit for each participant, the total expected profit for the service chain, and the percent of total expected profit for each participant. The Transfer Payment columns show the amount of expected profit to be transferred to or from each participant such that each participant maintains its percent of total expected profit that it would have received under Decentralized Control with No Coordination along with each participant's post-transfer expected profit.

In theory, there are δ_i such that the solution is not Pareto optimal. In the instance where the expected profit under Decentralized Control with No Coordination for any participant is higher than its expected profit under Decentralized Control Coordinated Using Salvage Manipulation, that participant may choose not to enter a contract requiring salvage manipulation with the retailer. Similarly, a participant whose percent of total expected profit for the service chain would decrease under a salvage manipulation contract might agree to the salvage manipulation contract with the retailer, but then might demand a post-transfer payment from other participants to maintain its percent of total expected profit. Moreover, all participants in the service chain might deem it equitable to achieve their pre-coordination share of the total expected service chain profit. For example, Table 1 shows that the retailer expects to receive 54% of the total expected profit if it maximized its profits under Decentralized Control with No Coordination. However, after coordination using salvage manipulation, it expects to receive only 50% of the total profit. The transfer payment arrangement would stipulate post-profit realization splitting of achieved profit per the percent under Decentralized Control with No Coordination (i.e., 54% of realized profit would go to the retailer).

Because the salvage manipulator value is a subsidy (positive or negative) allowing each participant to achieve the centralized ratio, the net effect is that subsidies flow from participants that otherwise would select higher quantities locally (due to the cost ratio of underage to overage) to participants that otherwise would normally select smaller quantities. In other words, the retailer allows the flow of promised subsidies among all participants indirectly.

DISCUSSION AND CONCLUSIONS

Centralized control results in the highest expected profit for the *n*-supplier, one-retailer service chain. However, it typically is not desirable or feasible to have a single company that owns or controls the entire service chain. Often in the service industry, the retailer does not own all of the suppliers of the required components (e.g., hotel room, rental car, and airline seat) to bundle complete packages for the customer. Therefore, a decentralized service chain is the business setting within which the retailer and suppliers of components have to operate. With each participant acting independently, we have shown that the expected profits of the total service chain may decrease due to asymmetries in the critical ratios among the participants, even with perfect information availability.

We have introduced a new coordinating mechanism called salvage manipulation, which allows the service chain to obtain the same expected profit as under centralized control. Our contribution comes from eliminating the need to use revenue sharing combined with subsidies to coordinate a service chain. Revenue sharing alone cannot coordinate all service chains, and the administrative burden and ability to cheat make it unappealing. It is possible that a full application of salvage manipulation makes one or more participants worse off than under decentralized control. If this is the case, participants may choose to stay with decentralized quantities or to select a contract that also involves salvage manipulation combined with transfer payments to ensure that no participant's percent of total expected profit is worse off after coordination with salvage manipulation. Our model accommodates cases when prices at both echelons are exogenous. Prior research required suppliers to be able to set prices (i.e., ignore market prices for their goods) while requiring the retailer to adhere to market prices. An interesting future research extension could be looking at performance of our mechanism when the demand distribution is unknown, as done in Benzion, Cohen, and Shavit (2010). Eliminating the demand distribution shape as a required input would enhance the appeal of any coordination mechanism for implementation.

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BIOGRAPHY

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ALL YOU CAN EAT: BEHAVIORAL EVIDENCE FROM TAIWAN

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ABSTRACT

All-you-can-eat buffet is a popular meal-serving system for people who like to eat a lot and want a wide variety of food. This paper uses the theory of planning behavior to investigate the behavioral intention and overeating behavior of people at an all-you-can-eat restaurant through a questionnaire format from January 1, 2013 to April 1, 2013. The research findings show that attitude, subjective norms, and perceived behavioral control all have a significantly positive influence on behavioral intention. However, people's overeating behavior is determined mainly by perceived behavioral control, not by behavioral intention.

JEL: M31, M39

KEYWORDS: All-You-Can-Eat Buffet, Theory of Planned Behavior

INTRODUCTION

All-you-can-eat buffet is a popular meal-serving system for people who like to eat a lot and want a wide variety of food. However, many consumers have had the experience of eating too much and then feeling uncomfortable after going to an all-you-can-eat restaurant, which gives rise to the following questions: Do individuals always eat too much in an all-you-can-eat restaurant? Why do individuals pay money and consume an amount of food that is more than they can normally eat, thus decreasing their utility of consumption or destroying their health? What factors cause consumers' overeating behavior? The theory of planned behavior (TPB) has been widely used in hospitality research. For example, Chen and Tung (2014), Teng, Wu, and Liu (2013), Han, Hsu and Sheu (2010), and Han and Kim (2010) explained customers' intention to visit a green hotel by applying TPB. Padgett, Kim, Goh, and Huffman (2013) used TPB to explain Generation Y Chinese consumers' purchase behavior regarding a fast food restaurant meal. Seo, Lee, and Nam (2011) explored factors influencing fast food consumption behaviors of middle-school students in Seoul by applying TPB. Dunn, Mohr, Wilson, and Wittert (2011) examined factors influencing fast-food consumption in Australian.

Most all-you-can-eat related studies focus on pricing (Erez and Gideon, 2012; Just and Wansink, 2011; Nahata, Ostaszewski, and Sahoo, 1999), paying timing for a meal (Siniver, Mealem and Yaniv, 2013), service quality (Oyewole, 2013a; 2013b), and the relationships between eating behavior and obesity (Wansink and Payne, 2008; Temple and Nowrouzi, 2013). With limited research targeting the behavioral intention or the overeating behavior of people dining at all-you-can-eat restaurants, this paper uses the theory of planning behavior to investigate these two issues through a questionnaire format. Results of this study can provide a reference for buffet practitioners and consumers. The rest of this paper is organized as follows. Section 2 reviews previous research on all-you-can-eat buffet restaurant and the theory of planned behavior. Section 3 describes the data and method we employ. Section 4 reports the empirical results, and section 5 concludes the paper.

LITERATURE REVIEW

All-you-can-eat buffet is a widespread meal-serving system where consumers decide how much food they wish to eat in a single meal for a fixed price. In a buffet restaurant, food is often placed in a public area

where diners generally serve themselves, and they can directly view the food and immediately select which dishes they wish to consume. These all-you-can-eat buffet restaurants are particularly great for people who like to eat a lot and want a wide variety of food. People's eating behavior at an all-you-can-eat buffet restaurant is related to price, paying timing for the buffet meal, service quality, and obesity. Siniver, Mealem and Yaniv (2013) conducted two experiments in a sushi restaurant to test whether a buffet restaurant's practice of collecting the meal price in advance rather than at the end actually encourages overeating. Their experiments reveal that paying for the buffet meal after eating reduces sushi consumption by about 4.5 units as compared to paying before eating. Another experiment conducted by Just and Wansink (2011) at an all-you-can-eat pizza restaurant shows that a 50% meal price discount led customers to eat 27.9% less pizza and that individual taste ratings of pizza are inversely related to how much is consumed. Namely, individuals may consume an amount that enables them to get their money's worth rather than eating until their marginal utility of consumption is zero.

Oyewole (2013a) conducted a two-phase study to determine the dimensions of service quality in the all-you-can-eat buffet restaurant industry from the consumer's perspective. Their factor analysis found twelve distinct dimensions were able to discriminate among three groups of buffet restaurant patrons. Oyewole's (2013b) results also show that "freshness," "hygiene," "variety and reliability," and "value," are the top four dimensions of service quality most important to consumers. Temple and Nowrouzi (2013) conducted the relationship between buffets, energy intake, and weight gain. Wansink and Payne (2008) investigated whether the eating behaviors of people at all-you-can-eat Chinese buffets differ depending upon their body mass. They found that people with higher body mass index (BMI) levels are more likely to be associated with using larger plates, seating facing the buffet, using forks, serving themselves immediately, not having a napkin on their lap, leaving less food on their plates, and chewing less per bite of food. The theory of reasoned action (TRA) is a model for the prediction of behavioral intention developed by Fishbein and Ajzen (1975, 1980).

Behavioral intention is used to predict one's intention to perform a certain behavior. TRA states that a person's behavioral intention depends on his attitude toward the behavior and his subjective norms. Attitude is the individual's positive or negative feelings about performing a behavior (Fishein, 1967), and it can be measured by the sum of beliefs about a particular behavior weighted by evaluations of these beliefs (Lee and Green, 1991). Subjective norms are an individual's perception about a particular behavior and are seen as being a combination of beliefs of what others think along with the motivation to comply with others (Fishbein & Ajzen, 1975). The judgments of significant relevant individuals or groups influence these subjective norms. TRA has been tested in many areas such as dieting (Sejwacz, Ajzen & Fishbein, 1980) and consuming genetically engineered foods (Sparks, Shepherd & Frewer, 1995). Sheppard, Hartwick, and Warshaw (1988) also confirmed a high correlation of attitude and subjective norms with behavioral intention and subsequently to behavior.

Under TRA, a person's volitional (voluntary) behavior is predicted by his attitude toward that behavior and how he thinks other people would view him if he performed that behavior. Moreover, when someone forms an intention to act, that person will be free to act without limitation. However, in practice, constraints such as limited ability, time, environmental or organizational limits, and unconscious habits limit the freedom to act. Therefore, Ajzen (1985, 1991) revised and extended TRA into the theory of planned behavior (TPB) by adding a new component: perceived behavioral control. Specifically, he extended TRA to cover non-volitional behaviors for predicting behavioral intention and actual behavior.

Perceived behavioral control is an individual's perceived ease or difficulty at performing a particular behavior and is determined by the control beliefs and perceived facilitation. TPB suggests that attitude toward behavior, subjective norms, and perceived behavioral control together decide an individual's behavioral intention and behavior. Subjective norms look at the influence of people's social environment on their behavioral intentions. An individual will refer to or comply with people who are important to him and who think he should or should not perform a certain behavior (Venkatesh and Davis, 2000). Perceived behavioral control includes some internal factors (such as individual difference, information, skills, abilities, power of will, emotions and compulsions, forgetting, and knowledge) and some external

factors (such as time and opportunities). Previous studies have shown that people's behavior is directly or indirectly influenced by their confidence in their ability to perform that behavior (Fishbein, 1963; Fishben & Ajzen, 1975; Bandura, Adams, Hardy, and Howells, 1980; Ajzen & Madden, 1986; Ajzen, 1991).

RESEARCH METHODS

The gauging scales are selected from the literature. Attitude is gauged by 5 items taken from Fishbein (1967). Subjective norm is measured by 5 items by means of Fishbein and Ajzen (1975) and Fishbein and Ajzen (1980). Perceived behavioral control is measured by 3 items taken from Ajzen (1985, 1991). Behavioral intention is gauged by 6 items and overeating behavior is measured by 3 items. According to the research framework, we design the items of the questionnaire for the five dimensions: attitude, subjective norms, perceived behavioral control, behavioral intention and behavior. These items are measured on Likert's five-point scale, ranging from 1 point to 5 points, denoting "very disagree", "disagree", "neutral", "agree", and "very agree", respectively. We administered the questionnaires to residents living in Taiwan using convenience sampling from January 1, 2013 to April 1, 2013.

The main modes include written and Internet questionnaires. A total of 550 responses were distributed, and 510 usable responses were collected. An acceptable response rate was 92.73%. The questionnaire was modified through a pilot test and a pre-test. The research subjects were consumers who live in Taiwan and who have dining experiences in an all-you-can-eat restaurant. The pre-test results show a good reliability, because the Cronbach's α coefficient has a value greater than 0.7 (Nunnally, 1978; Wortzel, 1979). The results from factor analysis also indicate that all factors have an eigenvalue greater than 1, a factor loading greater than 0.6, a cumulative explained variation greater than 50%, and all the correlations between each factor and their items are greater than 0.5. This meets the criterion of convergent validity proposed by Kaiser (1958). Accordingly, we use this pre-test questionnaire as our formal questionnaire.

ANALYSES AND RESULTS

We perform data analyses on SPSS 13.0 and AMOS 19.0. The methods adopted include descriptive statistics analysis, reliability and validity analysis, correlation analysis, and structural equation modeling (SEM) analysis. Through descriptive statistics analysis in Table 1, we found that the basic attributes of major group are female (56.9%), unmarried (69.2%), younger than 25 years old (51.2%), university education level (66.9%), live in central Taiwan(62.4%), students (42.5%) and monthly income below NT$25,000 (63.5%). Composite reliability (CR) is used as a measure of the reliability. It is defined to have "internal consistency reliability" when CR has a value greater than 0.7 (Fornell and Larcker, 1981). As presented in Table 2, all the dimensions have a CR value greater than 0.7, which indicates good internal consistency reliability. Convergent validity and discriminant validity are commonly regarded as subsets of construct validity.

This research conducts confirmatory factor analysis (CFA) to measure convergent validity. According to the results in Table 2, all CR estimates are greater than 0.7, all factor loadings are greater than 0.5, and all Average Variance Extracted (AVE) estimates are also greater than 0.5 in these five dimensions. This is consistent with the criterion of convergent validity proposed by Fornell and Larcker (1981) and Hair et al. (2009).

Table 1: Descriptive Statistics Analysis of Sample

	Items	No. of respondents	Percent (%)
Gender	Male	220	43.1
	Female	290	56.9
Marital status	Unmarried	353	69.2
	Married	157	30.8
Age group	Younger than 25 years old	261	51.2
	26-35 years old	92	18.0
	36-45 years old	82	16.1
	46-55 years old	66	12.9
	Older than 55 years old	9	1.8
Education level	Junior high school	33	6.5
	Senior high school	94	18.4
	University	341	66.9
	Graduate school	42	8.2
Residential area	Northern Taiwan	118	23.1
	Central Taiwan	318	62.4
	Southern Taiwan	59	11.6
	Eastern Taiwan	13	2.5
	Others	2	0.4
Occupation	manufacturing industry	64	12.5
	financial industry	20	3.9
	technology industry	34	6.7
	service industry	89	17.5
	public servants & teachers	20	3.9
	students	217	42.5
	others	66	12.9
Monthly income	below 25,000	324	63.5
	25,001-50,000	148	29.0
	50,000-75,000	28	5.5
	75,000-100,000	9	1.8
	more than 100,000	1	0.2

This table shows descriptive statistics analysis of the sample. The first two columns represent demographic variables and their items considered in this research. The third and fourth column reports the number of respondents and its corresponding percent, respectively.

Table 2: Confirmatory Factor Analysis

Dimension		Factor loading	SMC	CR	AVE
Attitude	AT1	0.754	0.569	0.838	0.509
	AT5	0.757	0.573		
	AT6	0.700	0.490		
	AT7	0.675	0.456		
	AT8	0.676	0.457		
Subjective Norms	SN4	0.522	0.272	0.844	0.525
	SN5	0.825	0.680		
	SN6	0.807	0.651		
	SN7	0.699	0.488		
	SN8	0.730	0.533		
Perceived Behavioral Control	PB2	0.644	0.415	0.771	0.531
	PB6	0.732	0.536		
	PB7	0.802	0.643		
Behavioral Intention	BI1	0.790	0.624	0.894	0.585
	BI2	0.772	0.596		
	BI3	0.844	0.713		
	BI4	0.764	0.583		
	BI5	0.704	0.495		
	BI6	0.706	0.499		
Behavior	BE1	0.939	0.881	0.849	0.665
	BE2	0.918	0.843		
	BE13	0.520	0.270		

This table shows confirmatory factor analysis on attitude, subjective norms, perceived behavioral control, behavioral intention, and behavior. SMC, CR, AVE represents square multiple correlation, composite reliability, and average variance extracted, respectively.

Table 3 presents the results of discriminant analyses, with the values on the diagonal being AVE of our five dimensions (constructs): attitude (AT), subjective norm (SN), perceived behavioral control (PB), behavioral intention (BI), and behavior (BE). Values on the non-diagonal are the square of the correlation between two constructs. We note that the questionnaire has discriminant validity, because the AVE of each construct is greater than the square of the correlation between any two constructs (Fornell and Larcker, 1981). In addition, it also has content validity, because our scale and item contents are constructed according to the literature review and do pass the questionnaire pre-test.

Table 3: Discriminant Validity Analysis

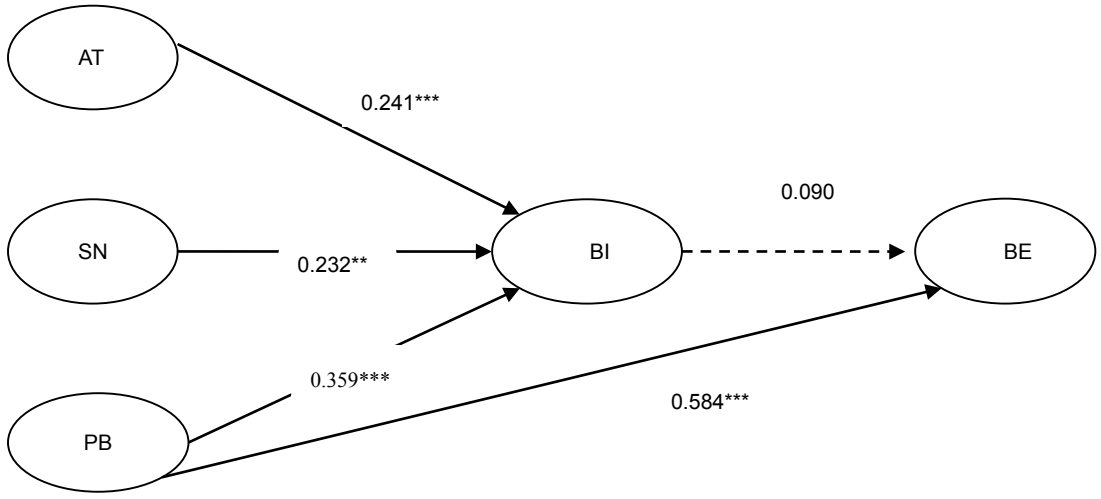
	AT	SN	PB	BI	BE
AT	0.509				
SN	0.274	0.525			
PB	0.271	0.118	0.531		
BI	0.287	0.221	0.271	0.585	
BE	0.215	0.127	0.362	0.237	0.665

This table shows the discriminant validity analysis. Values on the diagonal and non-diagonal are AVE estimates and the square of correlation between two constructs, respectively. AT, SN, PB, BI, BE represents attitude, subjective norms, perceived behavioral control, behavioral intention, and behavior, respectively.

This section conducts structural equation modeling (SEM) analysis to test the fit of the factors (dimensions) of attitude, subjective norms, perceived behavioral control, behavioral intention, and behavior. For a model with good fit, GFI (goodness of fit) should greater than 0.8 (Browne and Cudeck, 1993). AGFI (adjusted goodness of fit) should be greater than 0.8, and CFI (comparative fit index) should be greater than 0.9 (Doll, Xia, Torkzadeh, 1994; MacCallum and Hong, 1997; Hair et al., 2009; Hu and Bentler, 1999; Gefen et al., 2000). RMSEA (root mean square error of approximation) should be under 0.08 (Brown and Cudeck, 1993), and the ratio of the chi-square value to degrees of freedom (x^2/df) should be no greater than 5 (Wheaton et al., 1977). The goodness-of-fit indices of the model are as follows: GFI is 0.879, AGFI is 0.848, CFI is 0.909, RMSEA is 0.073, and x^2/df is 3.689. All these indices are within the acceptable range, meaning that the overall model fitness is good.

Figure 1 presents the path analysis from SEM. According to the estimated values of the standardized parameters of the relationship model in Figure 1, we find that attitude, subjective norms, and perceived behavioral control all have a significantly positive influence on behavioral intention. Perceived behavioral control also has a significantly positive impact on behavior. However, the impact of behavioral intention on behavior is insignificant. These results indicate that attitude, subjective norms, and perceived behavioral control, together decide an individual's behavioral intentions. However, people's overreating behavior is determined mainly by perceived behavioral control, not by behavioral intention. These results only partially support the theory of planned behavior.

Figure 1: Path Analysis from SEM



*This figure shows the path analysis from SEM. ***, ** and * indicate significance at the 1, 5 and 10 percent levels respectively.*

CONCLUSION AND IMPLICATIONS

All-you-can-eat buffet is a popular meal-serving system for people who like to eat a lot and want a wide variety of food. However, many consumers have had the experience of eating too much and then feeling

uncomfortable after going to an all-you-can-eat restaurant, which gives rise to the following questions: Do individuals always eat too much in an all-you-can-eat restaurant? Why do individuals pay money and consume an amount of food that is more than they can normally eat, thus decreasing their utility of consumption or destroying their health? What factors cause consumers' overeating behavior? This paper uses the theory of planning behavior to investigate the behavioral intention and overeating behavior of people at an all-you-can-eat restaurant through a questionnaire format. The questionnaires were administered to residents living in Taiwan using convenience sampling from January 1, 2013 to April 1, 2013. The research findings show that attitude, subjective norms, and perceived behavioral control all have a significantly positive influence on behavioral intention. Perceived behavioral control also has a significantly positive impact on behavior. However, the impact of behavioral intention on behavior is insignificant. These results indicate that attitude, subjective norms, and perceived behavioral control, together decide an individual's behavioral intentions, but people's overreating behavior is determined mainly by perceived behavioral control, not by behavioral intention.

According to the research findings, we recommend that consumers should be aware that overeating is harmful when they go to an all-you-can-eat restaurant. For the sake of health, people should not eat too much even if they have enough time and the ability to eat a lot of food. On the other hand, we suggest that buffet restaurant practitioners should adopt a marketing strategy that primarily helps to increase consumers' positive attitude, subjective norms, and perceived behavioral control, thus increasing consumers' behavioral intention to go to an all-you-can-eat restaurant. Additionally, in order to reduce consumers' overeating behaviors, buffet restaurant practitioners may devise a discriminated pricing strategy. For example, they can price the meal according to different dining time or set a different price for males vs. females. They can also consider giving customers a discount if they shorten their dining time. The results of this study only partially support the theory of planned behavior, perhaps because the behavior we discuss in this study is an individual overeating rather than the general behavior of an individual actually going to an all-you-can-eat buffet restaurant. Future research is recommended to compare the differences between these two behaviors. Additionally, we only considered attitude, subjective norms, perceived behavioral control, behavioral intention, and behavior in this study. There are still other determinants of behavioral intention that could be included in more comprehensive models that have possibly higher explanatory power. Finally, most of the respondents in our study are from the age group of younger than 25 years old, students, or persons whose monthly income is below NT$25,000. The result may be biased due to the different behaviors among different age, occupation, or monthly income groups. Therefore, the results of the study can be further strengthened by balancing and comparing different age, occupation, and income groups.

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PATIENT LOYALTY TO HEALTHCARE ORGANIZATIONS: RELATIONSHIP MARKETING AND SATISFACTION

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ABSTRACT

This study examined a model of patient loyalty from the perspectives of relationship marketing and patient satisfaction. Data were analyzed in two separate but sequentially related stages using structural equation modeling with partial least squares. Patient satisfaction directly affected loyalty, but it did not mediate the relationship between relationship marketing and loyalty. Although healthcare providers can increase patient satisfaction by demonstrating trustworthiness and commitment and by the use of good communication skills, these factors do not have a significant effect on loyalty despite their overall positive impact.

JEL: I110, M310

KEYWORDS: Loyalty, Relationship Marketing, Patient Satisfaction

INTRODUCTION

Nowadays, every company is faced with sustained competitive rivalry and must compete to provide services that differ from those offered by their rivals. Some companies have realized that even a very good product is not a guarantee of long-term success (Gronroos, 2007) due, in part, to constantly increasing customer expectations regarding products. Thus, customers expect the same from all product offerings, and they are often disappointed.

Service providers include the customer in the product development process to build relationships. If a relationship impresses the customer, then the relationship is likely to be maintained over the long term (Gronroos, 2007). According to Sanchez, one of the basic goals of marketing is to determine the values of the customer and to incorporate them into marketing programs to enhance customer loyalty (Sanchez, 2003). Good relationships between customers and service providers can lead to satisfied customers (Anderson & Zimmerman, 1993). Overall satisfaction is a significant and direct precursor to loyalty (Bodet, 2008). Based on a previous study, Salgaonkar argued that satisfaction with a core service is important for overall customer satisfaction and, in turn, for customer loyalty. This also applies to healthcare (Salgaonkar, 2006).

The main goal of service providers is to meet the expectations of their consumers. In the domain of health services, the "consumer" is the patient, and healthcare providers manage patient expectations to minimize differences between such expectations and actual experiences (Baker, 1998). Patients seek healthcare to recover from illnesses and hope to receive good service, which they rate based on a series of variables that affect their satisfaction, engagement, and, ultimately, loyalty (Baird, 2013).

Healthcare is a very personal service. In general, patients who visit hospitals or clinics, sometimes accompanied by their families or relatives, are usually experiencing some degree of emotional and physical stress. Thus, issues related to the ability to meet the expectations of patients must be considered in the decision-making processes of service providers (Baird, 2000).

The field of healthcare is unique and cannot be held to the same standards of customer service that apply to other industries. Indeed, consumer decisions about other services can be avoided or postponed to a future date, depending on the wishes of the individual. In contrast, this is typically not an option in the health sector, where avoiding or delaying consumption decision may have serious implications for the health of the patient, potentially resulting in poorer health or even death. Thus, the factors that determine patient loyalty will vary from those that pertain to loyalty in other domains (Salgaonkar, 2006).

Every contact between a customer and an aspect of the service system ("service encounters") presents an opportunity to evaluate the service provider and the quality of the service, to form an opinion, as well as to interact with other patients (Salgaonkar, 2006).

Learning about patient loyalty, resulting from direct relationship marketing or from patient satisfaction, is important for healthcare organizations to sustain their enterprise in the long term. The purpose of this study was to analyze how subjects develop loyalty to healthcare organizations through relationship marketing and patient satisfaction. The discussion that follows is divided into three parts. First, it discusses patient loyalty to a healthcare organization using the data from all of the respondents. Second, the data were analyzed according to gender, and third, patient loyalty is discussed with reference to the age of respondents.

LITERATURE REVIEW

Loyalty

Customer loyalty is built with great effort by customized marketing programs that position the customer at the center of all the activities of the company. However, several multidimensional factors contribute to customer loyalty. Customer loyalty is also determined by the characteristics of the consumers. For example, some people do not like uncertainty and are very loyal to the first products they use. Others are more "adventurous" and want to try new products even though they like or are satisfied with previous products.

Originally, brand loyalty and customer loyalty had almost the same meaning. Moreover, several previous studies that extensively examined brand loyalty for tangible goods served as the basis for a concept of customer loyalty that now extends to service organizations that typically provide less tangible products (Gremler & Brown, 1996).

Loyalty is continued use of a product or service and is grounded in attitudes toward the product or service. The difference between loyal and habitual use relates to the dynamics underlying the selection of a particular product or service. A loyal buyer is, at some level, engaged in a relationship, whereas a habitual buyer is indifferently engaging in routine behavior (Knox, 1998). Dick and Basu (1994) treated the concept of customer loyalty as the relationship between one's attitude toward an entity (brand, service, store, and vendor) and one's patronage behavior. Gremler and Brown identified three separate dimensions of customer loyalty: behavioral loyalty, attitudinal loyalty, and cognitive loyalty. Behavioral loyalty was defined in terms of consumers' behaviors (such as repeat purchases) related to certain brands over time (Gremler & Brown, 1996).

Subsequent studies identified two dimensions of customer loyalty, behavior and attitude, and began to incorporate a more cognitive orientation, reflecting the assumption that a customer who was truly loyal did not consider alternative products when making the next purchase decision (Gremler & Brown, 1996).

Because of the complex nature of the services and the high level of involvement of patients in interactions with physicians, the interaction with the provider will be more important than that with the environment in healthcare settings. Patients come to healthcare settings to recover from illnesses. The core services provided can create positive physical *and* psychological reactions to doctors and treatment, which can increase loyalty (Salgaonkar, 2006). Everything a patient sees, hears, feels, and experiences in a healthcare setting should instill trust (Baird, 2013).

Relationship Marketing

Nowadays, many service providers employ relationship marketing strategies. Although an old idea, relationship marketing is considered to be at the forefront of marketing practices for services. Indeed, the creation of value through business relationships between buyers and sellers is becoming one of the most discussed topics in the marketing literature (Walter, Ritter, & Gemunden, 2001). This idea was actually first introduced by Berry in 1983 and has been recognized by Barnes and Gronroos (Berry, 1995).

Generally, consumers who use specific service suppliers for the first time feel uncertain and vulnerable, and these reactions are likely to be heightened for personal services (Berry, 1995). If a customer has no intention of establishing a relationship with a company, he or she can switch providers at any time. On the other hand, if the customer is seeking to establish a relationship, he or she would be willing to purchase the products or services in question without having to be "forced" to do so (Kumar, Bohling, & Ladda, 2003).

Marketers began to change their views about the importance of relationships with customers because the creation and reinforcement of such relationships is the basis for profitable growth in the long run. As a result, relationship marketing quickly changed from a model based on an old-fashioned monologue into one based on a dialogue intended to build mutually beneficial long-term relationships between an enterprise and its customers. That is, marketers propose and customers dispose (Sanchez, 2003).

According to Berry, relationship marketing involves the efforts of multi-service organizations to attract, maintain, and enhance customer relationships. Good service is necessary to maintain the relationship (Berry, 2002), and the company must improve its services, elevating those that are "just good" to excellent.

Based on Bove and Johnson (2001), who also endorsed the opinion expressed by Dwyer, Crosby, Kumar, and Dorsch (i.e., that relationship strength and quality can be conceptualized as trust and commitment). I hypothesized that greater trust and commitment would be associated with a stronger the relationship between the customer and the service provider. According to Berry (1995), a company can build consumer trust in three ways: 1) opening lines of communication, 2) guaranteeing their service, and 3) providing a higher standard for their behavior. Morgan and Hunt (1994) proposed a model in which commitment and trust are key to the success of a marketing relationship, serving as mediating variables because they encourage exchange partners to preserve the investment in the relationship, inhibit pursuit of short-term alternatives, and maintain confidence that partners will not act opportunistically.

Correlation between Loyalty and Relationship Management

According to Gronroos (2007), one approach to business involves creating an attraction between the customer and a service company that may result in contact that leads to a mutually beneficial relationship. Such encounters generate services, a process or performance in which the customer is involved and that can last a long period of time, a short period, or even just a single meeting.

In accordance with Sanchez (2003), the establishment of a relationship with a customer that leads to enduring, profitable growth, rather than making a sale, is the central goal of relationship marketing. Sales are the beginning of an opportunity to turn a buyer into a loyal customer.

Customers who are loyal to a product are happy to help the company encourage others to try and even buy the company's products. Sanchez (2003) also noted that brand loyalty is an asset. Without the loyalty of its customers, a brand is merely a trademark—an ownable, identifying symbol with little value. The loyalty of its customers renders a brand much more than a trademark.

One increasingly common trend in relationship marketing by service providers, including healthcare companies such as hospitals and health clinics, is to increase the number of loyal customers by partnering with customers, suppliers, and other service providers within the same sector. In the healthcare sector, this trend is driven primarily by the intense competition among organizations (Naidu, Partivar, Sheth, & Wasgate, 1999). These authors proposed that relationship marketing programs may be more successful when there is open communication, mutual commitment, operational alignment, and a mutual understanding of each other's goals.

In the healthcare business, the customer is the patient. The relationship between patients and healthcare providers includes the interactions between patients and physicians, nurses, and service personnel. Communication is an important factor in building a relationship between physician and patient (Ishikawa et al., 2002). Based on a systematic meta-analysis, Griffin et al. asserted that the success of the physician–patient interaction is at the heart of medicine (Griffin et al., 2004). This was confirmed by Beck et al., who found that the physician–patient interaction was a central and essential element of ambulatory care medicine. They also cited evidence linking specific verbal and nonverbal behaviors to specific kinds of interaction between ambulatory primary care providers and their patients (Beck, Daughtridge, & Sloane, 2002). Based on the foregoing, the following hypothesis was proposed:

H1: That relationship marketing and loyalty are significantly positively correlated

Patient Satisfaction

As customer satisfaction refers to a specific evaluation of the overall service provided, it must be assessed based on the experience during the process of service delivery. According to Kotler (2003), satisfaction involves feeling happy or disappointed and derives from a comparison between one's impression of the performance (or outcome) of a product or service and one's expectations.

Many researchers have found that consumer satisfaction and patient satisfaction cannot be equated. As described by Newsome and Wright (1999), marketing-oriented conceptual models do not easily fit or are simply inappropriate for many common medical scenarios. The differences and the role(s) played by patient expectations, perceptions, and disconfirmation are not yet fully understood. The authors also said that many patients experience themselves in relation to a healthcare system, and it is possible that some patients may simply remain passive and not evaluate the service provided. Williams (1994) reported that patients may have a complex set of important and relevant beliefs that cannot be expressed in terms of satisfaction. According to Williams, the results of a satisfaction survey should be interpreted in the context of a number of assumptions about what the patient really means by "satisfied." Mpinga and Chastonay (2011) explored whether patient satisfaction was a health indicator by comparing health status with general patient satisfaction under the assumption that patient satisfaction may be useful as a health indicator. They concluded that patient satisfaction can be used as an indicator of health status.

Patient satisfaction with primary care professionals depends on personal characteristics. Age, health status, and socioeconomic status appear to have the strongest influence on level of satisfaction in this regard

(Bowman, Herndon, Sharp, & Dignan, 1992). It has also been noted that nurses are good communicators who spend time with patients and provide adequate information about the patients' conditions. Jenkinson et al. (2002) reported that age and overall self-rated health were only weakly related to satisfaction, and linear regression analyses have shown that the major determinants of patient satisfaction were physical comfort, emotional support, and respect for patient preferences. Merkouris et al. (2004) compared quantitative and qualitative approaches to the measurement of patient satisfaction with nursing care and concluded that a qualitative approach was better able to identify both the explicit and implicit attitudes of patients than was a quantitative approach. These results were used to evaluate, compare, and monitor treatments.

Correlation between Relationship Marketing and Patient Satisfaction

Relationship marketing includes how a company relates to its customers and thus involves more than just communication (Gronroos, 2007). In a competitive environment, marketing should involve efforts to establish relationships with potential consumers. The relationship between the consumer and the service provider can last a long time when companies focus on the customer as the center of their activities. Service providers in the field of healthcare include those involved in serving patients as consumers, such as managers, doctors, nurses, and administrative staff. In healthcare organizations, patients also interact with one another. A good relationship between the customer and the service provider can lead to a satisfied customer.

Anderson and Zimmerman (1993) found that a physician's perception of the relationship with his or her patients may be associated with patient satisfaction. In particular, physicians who characterized the patient–physician relationship as a partnership tended to have more satisfied patients than did those who view the relationship as controlled by the physician. These findings also indicated that a physician's sex and number of years in practice were unrelated to patient satisfaction.

Bowman et al. (1992) assessed the validity, reliability, and utility of the "Patient–Physician Interaction Scale" (PDIS) in a university-based family practice center. Data were collected at the time of the visit and 1 month later during both health maintenance appointments and visits in response to specific presenting problems. PDIS scores were correlated with patient assessments of overall satisfaction ($P < 0.01$), which demonstrated the criterion-based validity of the measure. The internal consistency (reliability) of the PDIS was tested with Cronbach's α, which was consistently >0.80. Given the foregoing, I proposed the following hypothesis:

H2: Relationship marketing and patient satisfaction are significantly positively correlated

Correlation between Patient Satisfaction and Loyalty

McDougall and Levesque (2000) found that consumer satisfaction was strongly related to the establishment of loyalty (an average $R^2 = 0.833$ for the four units of service). Fornell et al. (1996) created a model based on the American Customer Satisfaction Index (ACSI) and found that the ACSI was positively related to customer loyalty. Gronhold et al, (2000) subsequently developed a model of the European Customer Satisfaction Index (ECSI) and conducted a pilot test in 12 countries, including Denmark. Customer satisfaction had a strongly positive effect on the establishment of loyalty ($R^2 = 0.691$, on average). Olsen (2002) conducted a split-sample survey of households in Norway to examine evaluations of different seafood products. The authors defined and measured relative attitudes and compared the results to evaluations of dissimilar or individual products.Their model included satisfaction as a mediator between quality and repurchasing loyalty. The relationship between satisfaction and loyalty was significant and positive across products in both the comparative and non-comparative approaches. Based on the foregoing, I proposed the following hypothesis:

H3: That patient satisfaction and loyalty are significantly positively related

Patient Satisfaction Mediates the Relationship between Relationship Marketing and Loyalty

Patients who have already been satisfied (i.e., have received and reacted positively to treatment from physicians and nurses), become committed to (Morgan & Hunt, 1994) communicate well with (Ishikawa et al, 2002), and are devoted to their healthcare providers. That is, patient loyalty can be a direct result of a marketing relationship (Sanchez, 2003) or, for new patients, it can emerge as an indirect result of satisfaction (Merkouris, Papathanassoglou, & Lemonidou, 2004). Based on the foregoing, I proposed the following hypothesis:

H4: That patient satisfaction mediates the relationship between relationship marketing and loyalty.

DATA AND METHODOLOGY

Research Design

This study was designed to test the associations among relationship marketing, patient satisfaction, and loyalty as well as to examine whether patient satisfaction mediates the association between relationship marketing and loyalty to healthcare organizations.

Research was conducted at one hospital (Banyumas Regency Hospital) and two clinics (the Red Cross Branch of Banyumas Clinic and the Muhammadiyah University of Purwokerto Clinic) in Indonesia. Questionnaires were distributed to individuals (or the adult representatives of children) undergoing outpatient treatment at the hospital or clinics.

Operational Definitions of Research Variables and Indicators:

Conceptualization of relationship marketing: according to Berry (2002), relationship marketing refers to efforts by multi-service organizations to attract, maintain, and enhance customer relationships. Operationalization of relationship marketing: Morgan and Hunt (1994) proposed a model in which commitment and trust were key to the success of a marketing relationship. Communication is also an important contributor to the establishment of a relationship between a physician and a patient (Ishikawa et al, 2002). Thus, this study examined commitment, trust, and communication skills as indicators in this regard.

Conceptualization of patient satisfaction: satisfaction reflects the degree to which one feels happy or disappointed; it results from a comparison between the perceived performance (or outcome) of a product or service and expectations (Kotler, 2003).

Operationalization of patient satisfaction: Patient satisfaction was defined as the extent to which a patient's expectations or needs were adequately met by the service provided. This study used treatment experience, feelings of happiness or disappointment, and whether respondents would recommend the service to others as indicators in this regard.

Conceptualization of loyalty: loyalty is the degree to which a customer repeatedly patronizes a service provider, has a positive attitude toward the provider, and considers using only this provider when a need for the service arises again (Gremler & Brown, 1996).

Operationalization of loyalty: patient loyalty is increased by relationship marketing and satisfaction. This study used the extent to which respondents felt positively about and defended their service providers as well as repeat patronage as indicators in this regard.

Data Collection

We collected data through questionnaires to patients who had been undergoing treatment in Banyumas Regency Hospital, Red Cross Clinic Banyumas Branch and Muhammadiyah University of Puwokerto Clinic. The questionnaires were distributed to respondents at the time of their treatment between 15 February and 15 March 2013. In total, 315 questionnaire sets were distributed. However, only 307 were completed and returned to the researcher. Three respondents did not complete all questions, and five did not return their questionnaires.

Data regarding sex, age, education level, and the purpose of medical treatment were obtained. In terms of age, the largest group of respondents consisted of those aged 17–25 years and the smallest group consisted of those aged younger than 17 years. There were 122 male respondents and 185 female respondents. In terms of educational level, the largest group consisted of those who graduated from high school, whereas the smallest consisted of those who did not complete primary school. Most patients at Banyumas Regency Hospital saw medical specialists, whereas most patients at the Red Cross Branch Clinic and Muhammadiyah University Clinic were treated by general practitioners.

Data Analysis

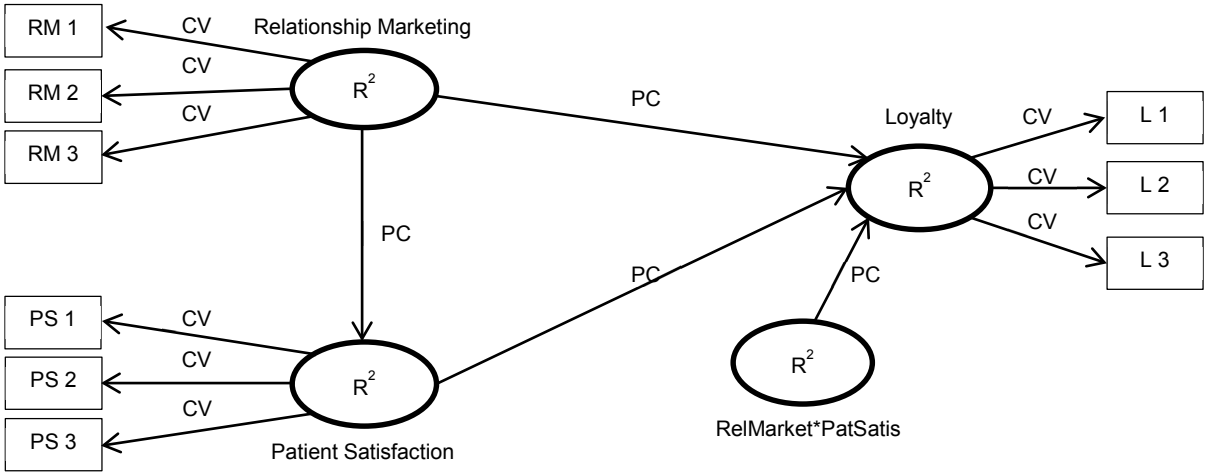
The data were analyzed in two separate, but sequentially related, stages using structural equation modeling (SEM) with partial least squares (Smart PLS 2.0). I first designed the measurement model (outer model) to determine the validity and reliability of the indicators of the latent variables. Second, the structural model was tested by designing the inner model. Once the model was judged to meet the criteria, the next outer model was tested. During this stage, the relationships among the latent variables were addressed based on the theoretical assumptions of the study. The structural model of the relationships among the latent variables was based on the formulation of the research problem or hypothesis. Structural equation modeling (SEM) involves generalizations and extensions of first-generation procedures, such as principal component analysis, factor analysis, discriminant analysis, and multiple regressions. The application of certain constraints or assumptions in SEM allows for more flexibility (Chin, 1998). PLS Path Models were used to analyze the moderating effects of the variations in the factors that affect the strength or direction of the relationship between exogenous and endogenous variables (Henseler & Fassot, 2010). In this study, patient satisfaction was the moderating variable, which may strengthen or weaken the relationship between the variables of relationship marketing and loyalty.

In designing the measurement model (outer model), measures used for the constructs included convergent and discriminant validity, composite reliability, and Cronbach's α. Convergent validity measures the magnitude of the correlation among the latent variables within a construct by examining the reliability of an item in terms of a standard loading factor. A correlation can be said to be valid if it has a value >0.7. Loadings of 0.5 or 0.6 may be acceptable if the research is still at an early stage of developing measurement scales (Chin, 2010). Discriminant validity, the next evaluation assessed and compared the discriminant validity and the square root of the average variance extracted (AVE). The model was assessed by measuring the cross-loading between constructs. When their correlation with each indicator construct is greater than that with the other constructs, the latent construct indicators are better predictors than are the other constructs. When the correlation between the latent construct indicator and each indicator construct is stronger than it is with the other constructs, good discriminant validity has been achieved. The recommended value is >0.5 (Fornell & Larcker, 1981). Composite reliability values of >0.6 indicate that the construct is reliable (Bagozzi & Yi, 1988). Cronbach's α, following a PLS approach: test–reliability

was assessed using Cronbach's α, which assesses the consistency of items. Cronbach's α is acceptable if $\alpha \geq 0.5$.

Designing the structural model (inner model), after the model was judged to meet the criteria for the outer model, the structural models were tested. This stage assessed the relationship among the latent variables based on the study's theoretical assumptions. The design of the structural model of the relationships among latent variables was based on the formulation of the research problem or hypothesis.

Figure 1: Model of Patient Loyalty to Healthcare Organizations Through Relationship Marketing and Satisfaction



RM1, 2 & 3 are indicators of Relationship Marketing; PS1, 2 & 3 are indicators of Patient Satisfaction; L1, 2 & 3 are indicators of Loyalty; R^2 is R square of the variables; CV is Convergent Validity (loading factor); PS is the Path Coefficient

The structural model is tested by evaluation of goodness of fit and path coefficients.

RESULTS AND DISCUSSIONS

The model of patient loyalty to healthcare organizations through relationship marketing and satisfaction was analyzed using structural equation modeling (SEM) with partial least squares (Smart PLS 2.0). We analyzed the data in three stages. In the first stage, the data were analyzed as a comprehensive dataset. In the second stage, the data were separated based on gender, and finally, in the third stage, based on age.

Firstly, the outer measurement model can be described as the comprehensive dataset. This measurement model was considered from a convergent validity (loading factor) perspective; based on table 1, the convergent validity value was > 0.7, indicating validity. All reported AVEs exceeded 0.5, confirming that all measures had discriminant validity. The values for composite reliability were >0.6, indicating that the latent constructs of loyalty, patient satisfaction, relationship marketing, and the construct that mediated between relationship marketing and patient satisfaction were reliable. The Cronbach's α values for all latent constructs were >0.5, indicating that the questionnaire was internally consistent.

Figure 2 shows the structural equation modeling with partial least squares of patient loyalty from the perspectives of relationship marketing and patient satisfaction. According to Figure 2, it can be seen that the R^2 (evaluation of goodness of fit) of patient satisfaction and loyalty are 0.740 and 0.647 respectively. The R^2 value of 0.740 indicates that 74.0% of the variability in the patient satisfaction construct was

explained by relationship marketing. The R^2 value of 0.467 indicates that 46.7% of the variability in loyalty can be explained by relationship marketing, patient satisfaction and also the moderating construct of relationship marketing and patient satisfaction.

Table 1: Convergent Validity, Discriminant Validity (AVE), Composite Reliability, and Cronbach's α in the Comprehensive Dataset

Discriminant Validity (AVE), Composite Reliability, Cronbach's α	**Statements of Questioner**	**Convergent Validity (Loading Factor)**
Relationship Marketing	ŁM1: The clinic/hospital is always willing to establish an ongoing relationship with me	0.897
AVE = 0.835	ŁM2: I entrust therapeutic treatment for a disease that I have experienced on the clinic / hospital is	0.929
composite reliability = 0.938	ŁM3: The doctors, nurses, and staff at the clinic/hospital are able to communicate well with me	0.914
Cronbach's α = 0.900	ŁS1: I was satisfied with my treatment at the hospital/clinic	0.912
Patient Satisfaction	ŁS2: The services I received at the hospital/clinic met my expectations	0.917
AVE = 0.757,	ŁS3: If asked about where to get the best treatment, I would recommend the hospital/clinic	0.775
composite reliability = 0.903, Cronbach's α = 0.838		
Loyalty	.1: If you find a hospital/clinic that offers a variety of high-quality services, you do not switch treatment facilities	0.777
AVE = 0.660,	.2: If anyone tried to criticize this clinic/hospital, I would try to defend it	0.806
composite reliability = 0.853,	.3: If the clinic/hospital advised me to undergo a wellness check to evaluate my progress, I would will return for that	0.853
Cronbach's α = 0.749		

RM: relationship marketing, PS: patient satisfaction, L: loyalty

Figure 2: Structural Equation Modeling with Partial Least Squares of Patient Loyalty as a Comprehensive dataset

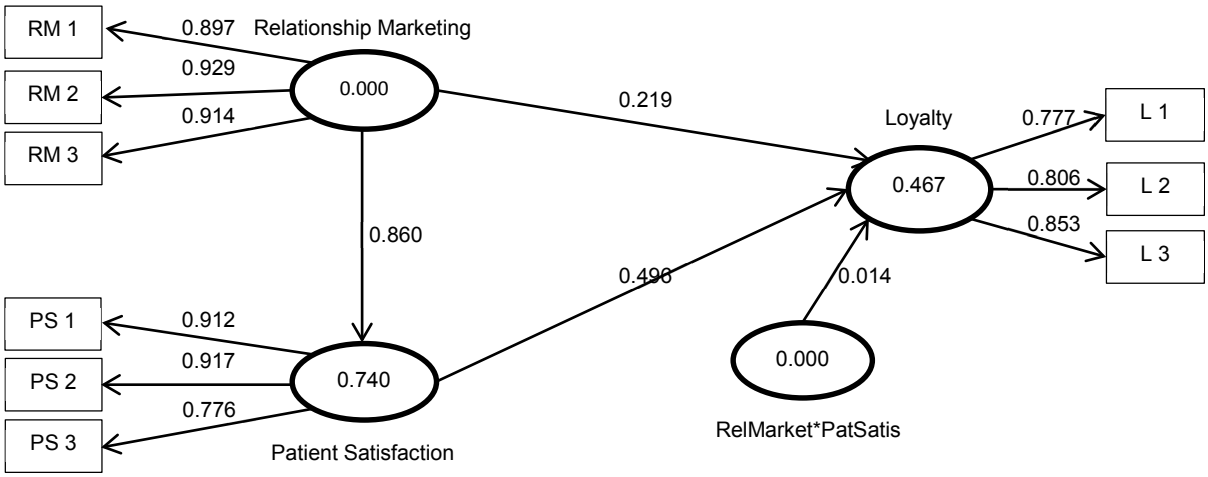


Table 3 describes the path coefficients of the model as a comprehensive dataset (307 samples). The results reflected positive relationships between constructs (see the original sample). Relationship marketing was positively related to loyalty (0.218), showing that the relationship between relationship marketing and loyalty was positive. However, the *t*-test revealed that relationship marketing had no significant effect on patient loyalty (1.087). In terms of statistical significance, given that the results of the *t* test < *t* table (α = 0.05), then hypothesis H1, that relationship marketing and loyalty are significantly positively correlated, should be rejected.

Table 3: Path Coefficients, t Statistics and Results

Relationship	Path Coefficient	*t* Statistic	Result
Relationship marketing → Loyalty	0.218	1.087	Not accepted
Relationship marketing → Patient satisfaction	0.860	25.619**	Accepted
Patient satisfaction → Loyalty	0.496	2.748**	Accepted
RelMarket*PatSatis → Loyalty	0.014	0.153	Not accepted

*RelMarket*PatSatis: mediated of relationship marketing x patient satisfaction*
*** significance at 5 percent*

Relationship marketing was positively related to patient satisfaction (0.860), and the *t*-test indicated that relationship marketing had a significant effect on patient satisfaction (significance at 5 %). Thus, hypothesis H2, that marketing and patient satisfaction are significantly positively correlated, should be accepted.

Patient Satisfaction was positively related to loyalty (0.496), and the *t*-test showed it had a significant effect on loyalty (significance at 5 %). Thus, hypothesis H3, that patient satisfaction and loyalty are significantly positively related, should be accepted.

Relationship marketing was positively related to loyalty (0.014) via the variable of patient satisfaction; however, the relationship was not significant according to the t test value of 0.153. Thus, hypothesis H4, that patient satisfaction mediates the relationship between relationship marketing and loyalty, should be rejected.

Clinics/hospitals attract, nurture, and build relationships with patients. The relationship between a clinic/hospital and a patient can be measured in terms of commitment, trust, and communication. This relationship had a positive relationship with loyalty, as measured by strongly positive attitudes toward the institution, willingness to defend it, and repeat patronage. However, relationship marketing had no significant effect on loyalty. Most respondents in this study were patients who received medication and treatment at hospitals and clinics that, as state employees, retired state employees, or people below the poverty line who became government dependents, used medical insurance provided by the government or universities. As hospitals and clinics remain in the same location, patients typically become regular customers. The direction of the influence of relationship marketing to loyalty was positive, indicating that a better relationship between healthcare providers and patients results in greater loyalty; however, this does not significantly affect attitudes. According to Dick and Basu (1994), a relatively negative attitude coupled with highly repetitive patronage can be considered "spurious loyalty," marked by the influence of non-attitudes on behavior. A loyalist is, at some level, involved in a relationship, whereas a habitual user behaves in a routine manner and is indifferent about his/her choice. These two types of consumers have different styles, although both seemingly exhibit behavioral loyalty (Knox, 1998).

A clinic/hospital is always willing to establish a continuous treatment relationship with patients who trust the facility. Good communication by doctors, nurses, and other parties at the clinic/hospital has a positive and significant impact on patient satisfaction. Patient satisfaction with the services received from a hospital/clinic encompasses the treatment experience, feelings of happiness or disappointment (in the context of expectations), and whether one would recommend the facility to others. The marketing relationship between healthcare providers and patients can be very important to the latter's evaluation of the healthcare provided by the former (Salgaonkar, 2006).

Satisfaction with treatment has a positive and significant impact on loyalty. Patients will show increased loyalty when they feel a positive connection with a hospital/clinic. However, patient satisfaction does not significantly mediate the relationship between relationship marketing and loyalty.

In the second stage, the data were analyzed by gender (122 males and 185 females). Table 4 shows the measurement of the model by convergent validity. It can be seen that all indicators have a value >0.7, except PS3 male. However, loadings of 0.5 or 0.6 may be acceptable because the research is still at an early stage in terms of developing measurement scales (Chin, 2010). All indicators of both genders were therefore considered valid. In Table 5, all of the outer measurement models can be seen to be acceptable in terms of the values of AVE, composite reliability and Cronbach's α.

Table 6 shows the evaluation of goodness of fit by gender. It can be seen that the R square of patient satisfaction is 0.346 for male and 0.536 for female. This indicated that 34.6% and 53.6% of the variability in the patient satisfaction construct was explained by relationship marketing for males and females, respectively. The variability in loyalty, explained by relationship marketing, patient satisfaction and also the moderating construct of relationship marketing and patient satisfaction, is 46.7% and 77.2% for males and females respectively.

Table 4: Convergent Validity by Gender

Indicators	Convergent validity of Male	Convergent validity of Female
RM1	0.867	0.907
RM2	0.923	0.932
RM3	0.895	0.921
PS1	0.880	0.923
PS2	0.894	0.928
PS3	0.693	0.798
L1	0.739	0.801
L2	0.850	0.781
L3	0.842	0.855

The recommended value for validity of convergent validity is > 0.7

Table 5: Discriminant Validity (AVE), Composite Reliability, and Cronbach's α by Gender

Gender	AVE	Composite Reliability	Cronbach's α	Result
Male				
Relationship marketing	0.801	0.924	0.876	Acceptable
Patient satisfaction	0.684	0.865	0.765	Acceptable
Loyalty	0.660	0.853	0.744	Acceptable
RelMarket*PatSatis	0.578	0.992	0.900	Acceptable
Female				
Relationship marketing	0.846	0.943	0.910	Acceptable
Patient satisfaction	0.783	0.915	0.860	Acceptable
Loyalty	0.661	0.854	0.751	Acceptable
RelMarket*PatSatis	0.788	0.971	0.966	Acceptable

The recommended value for validity of Average Variance Extracted (AVE) is >0.5. The recommended value for validity of composite reliability is >0.6. The recommended value for validity of Cronbach's alpha is ≥ 0.5

As demonstrated in Table 7, all path coefficients are positive except for the moderating effects, which are negative for male patients. The most significant relationship is that between relationship marketing and patient satisfaction for both male and female patients. The results are acceptable for all relationships. However, there is no moderating effect in patient satisfaction as demonstrated by the *t* statistics for both groups of patients.

As the path coefficient of both groups of patients are positive, it can be concluded that the better the relationship between service providers and patients, the greater the loyalty of both male and female patients. In other words, relationship marketing has a direct relationship to loyalty based on gender. This study supports the first hypothesis that relationship marketing and loyalty are significantly positively correlated. This is consistent with the results of the study by Ndubusi (2006). Patients, both male and female, will be

loyal if the service provider is able to attract, maintain, and enhance customer relationships, as described by Berry (2002).

Table 6: Evaluation of Goodness of Fit by Gender

Constructs	R^2 of Male	R^2 of Female
Loyalty	0.346	0.536
Patient Satisfaction	0.467	0.772

R^2 is R square

A similar result was seen in the relationship between patient satisfaction and loyalty, although for female patients the correlation was higher than for male patients. This finding is in line with the loyalty of patients seen in its entirety and is also consistent with the findings of McDougall and Levesque (2000), Fornell et al. (1996) and Gronhold et al, (2000). However, patient satisfaction was not found to be moderating the relationship between relationship marketing and loyalty. Patients can immediately be loyal, following relationship marketing from the service provider, without having to be satisfied first.

Table 7: Path Coefficients, t Statistic and Result by Gender

Relationship	Male			Female		
	Path Coefficient	*t* Statistic	Result	Path Coefficient	*t* Statistic	Result
Relationship marketing → Loyalty	0.278	3.534**	Accepted	0.126	10.147**	Accepted
Relationship marketing → Patient satisfaction	0.805	19.231**	Accepted	0.878	47.029**	Accepted
Patient satisfaction → Loyalty	0.264	1.894**	Accepted	0.651	4.796**	Accepted
RelMarket*PatSatis → Loyalty	-0.110	0.930	Not accepted	0.052	0.873	Not accepted

*RelMarket*PatSatis: mediated relationship of marketing × patient satisfaction. ** Significance at 5%.*

In the final stage, the data were analyzed by age (< 17-25 years old (125 samples), 26-46 years old (89 samples), and > 46 years old (93 samples)). Table 8 shows the convergent validity by age. All indicators meet the requirements, as described below the table. In other words, all indicators based on age were considered valid. According to Table 9, all of the outer measurement model can be seen as acceptable in terms of the values of AVE, composite reliability and Cronbach's α.

Table 8: Convergent Validity (Loading Factor) by Age

Indicators	Convergent Validity for Patients Aged < 17-25	Convergent Validity for Patients Aged 26-46	Convergent Validity for Patients Aged >46
RM1	0.912	0.820	0.761
RM2	0.925	0.890	0.849
RM3	0.905	0.903	0.737
PS1	0.924	0.907	0.771
PS2	0.934	0.892	0.791
PS3	0.792	0.695	0.772
L1	0.797	0.580	0.830
L2	0.889	0.576	0.534
L3	0.873	0.918	0.826

The recommended value for validity of convergent is > 0.7. Loadings of 0.5 or 0.6 may be acceptable because the research is still at an early stage of developing measurement scales (Chin, 2010)

In Table 10, the R squared (evaluation of goodness of fit) of patient satisfaction and loyalty by age are shown. The R^2 values of 0.446, 0.495, and 0.496 indicate that 44.6%, 49.5% and 49.6% of the variability in loyalty can be explained by relationship marketing, patient satisfaction and the moderating construct of relationship marketing and patient satisfaction for patients aged <17-25, 26-45 and >46 years, respectively. Furthermore, the R^2 values of 0.753, 0.667 and 0.509 indicate that 75.3%, 66.7% and 50.9% of the variability in the patient satisfaction construct can be explained by relationship marketing according to age.

Table 9: Discriminant Validity (AVE), Composite Reliability, Cronbach's α by Age

Gender	AVE	Composite Reliability	Cronbach's alpha	Result
< 17-25 years old				
Relationship marketing	0.835	0.938	0.901	Acceptable
Patient satisfaction	0.785	0.916	0.861	Acceptable
Loyalty	0.730	0.890	0.816	Acceptable
RelMarket*PatSatis	0.732	0.960	0.954	Acceptable
26-46 years old				
Relationship marketing	0.760	0.904	0.840	Acceptable
Patient satisfaction	0.700	0.874	0.781	Acceptable
Loyalty	0.503	0.743	0.596	Acceptable
RelMarket*PatSatis	0.603	0.929	0.917	Acceptable
> 46 years old				
Relationship marketing	0.615	0.827	0.687	Acceptable
Patient satisfaction	0.605	0.821	0.675	Acceptable
Loyalty	0.552	0.781	0.602	Acceptable
RelMarket*PatSatis	0.313	0.700	0.772	Acceptable

The recommended value for validity of Average Variance Extracted (AVE) is >0.5. The recommended value for validity of composite reliability is >0.6. The recommended value for validity of Cronbach's α is ≥ 0.5

Relationship marketing had positive and significant influences on loyalty in two age brackets. This result supports the first hypothesis that relationship marketing and loyalty are significantly positively correlated. In contrast, for patients over the age of 46 years, relationship marketing had a negative impact and no significant influence on loyalty. Furthermore, relationship marketing had positive and significant influences on patient satisfaction in all three age groups. The second hypothesis that relationship marketing and patient satisfaction are significantly positively correlated can be accepted. There was also a positive and significant relationship between patient satisfaction and loyalty. This finding supports the third hypothesis. Patient satisfaction as a mediation between relationship marketing and loyalty was negative for all age groups. This factor had no significant influence on loyalty, except for patients over 46 years old.

Table 10: Evaluation of Goodness of Fit by Age

Constructs	R^2 of <17-25 y.o	R^2 of 26-45 y.o	R^2 of >46 y.o
Loyalty	0.446	0.495	0.496
Patient Satisfaction	0.753	0.667	0.509

R^2 is R square. y.o is years old

Patients aged less than 17 to 25 years were loyal to their healthcare providers as a result of relationship marketing, and similarly if they were satisfied. However, satisfaction does not mediate the relationship. This pattern of relationships affecting loyalty is also found in patients aged between 26 and 45 years. Good relationships built by the hospital or clinic can make a patient at that age loyal and satisfied with the provider, without them having to be satisfied with the outcome of their health provision.

On the other hand, relationship marketing for patients aged over 46 years did not affect loyalty. Instead the relationship showed a negative correlation; the greater the relationship marketing, the lower the loyalty to healthcare providers, although the degree of influence was not significant. Nevertheless, these patients were satisfied after receiving relationship marketing. The results related to the mediated relationship between patient satisfaction and marketing indicated a significant relationship between relationship marketing and loyalty despite being negative.

According to Yoon et al (2009), more satisfactory decision-making occurred when an individual's ability was in accordance with the environment demands. The authors add that older adults have greater consumer experience and expertise and therefore may be more competent in making decisions. In this situation,

elderly patients have longer-term interactions with their healthcare providers and must be satisfied before becoming loyal. Relationship marketing is not a significant direct influence on loyalty, but it does affect it indirectly through satisfaction.

Table 11: Path Coefficients, t Statistic and Result by Age

Relationship	<17-25 y.o		26-45 y.o		> 46 y.o	
	Path Coefficient	*t* Statistic	Path Coefficient	*t* Statistic	Path Coefficient	*t* Statistic
Relationship marketing → Loyalty	0.368	6.952**	0.079	7.112**	-0.268	1.134
Relationship marketing → Patient satisfaction	0.868	38.820**	0.817	20.105**	0.714	10.267**
Patient satisfaction → Loyalty	0.315	2.212**	0.608	4.072**	0.631	4.980**
RelMarket*PatSatis → Loyalty	-0.020	0.260	-0.052	0.466	-0.354	2.146**

*RelMarket*PatSatis: mediated of relationship marketing x patient satisfaction. y.o is years old. ** significance at 5 %*

CONCLUDING COMMENTS

This study examined patient loyalty to healthcare providers and the factors that influence this phenomenon. Thus, this study extends previous research on loyalty, particularly with regard to healthcare organizations. This study also evaluated a model of loyalty to service providers that includes three antecedents: the marketing relationship, patient satisfaction, and the relationship between relationship marketing and loyalty as mediated by patient satisfaction. Patient loyalty was tested using structural equation modeling by partial least squares. The data were analyzed in two steps: first, the structural model was tested as an outer model; second, the inner model was tested. In addition, the data were analyzed in three ways: overall data; by gender; and by age.

The correlation between relationship marketing and loyalty was positive and significant on both genders, patients under 17–25 years old and those 25–45 years old. These results support the first hypothesis that relationship marketing and loyalty are significantly positively correlated. In contrast, for patients over 46 years old, that result was negative and showed no significant effect. When considering the whole dataset, the relationship between those factors was positive but not significant. In other words, hospitals or clinics can build good relationships through trust, commitment and communication skills to gain the loyalty of male and female patients aged up to 46 years. However, patients over 46 years of age were not affected by relationship marketing.

Relationship marketing and patient satisfaction are significantly positively correlated. This can be seen in the results for the comprehensive dataset, for gender and age. All patients become satisfied after the healthcare providers provide relationship marketing. As patients come to a healthcare provider seeking treatment and, typically, are in a state of pain and/or stress, it is not surprising that the data show that efforts by doctors, nurses, and other staff involved in healthcare to develop trust, show commitment, and use good communication skills contribute to an overall positive experience by patients. This pattern of relationship is similar to the relationship between patient satisfaction and loyalty. However, when looking at patient satisfaction as the mediation between relationship marketing and loyalty, the influence (though negative) is only on patients over 46 years old. For the comprehensive dataset and female patients, this relationship was positive but not significant. For male patients, those under 17 to 25 years old and those aged 25 to 45 years, there was no significant influence and the results were negative.

It can be argued that loyalty to hospitals or clinics can be achieved directly for male and female patients, patients less than 17 to 25 years old, and those of 25 to 45 years old. Some degree of loyalty can be achieved by healthcare organizations if they provide services, regardless of the type of patient. For elderly patients, loyalty can be gained through satisfaction.

Finally, this research contributes to understanding the importance of the efforts of healthcare organizations to develop loyalty by focusing on relationship marketing and patient satisfaction. The limitation of this study is that respondents were localized in one regency and the results may not be representative of the entire country. Future studies should sample more patients nationally and also examine the difference between private and government health providers.

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EVIDENCE THAT TRAVEL PRODUCT KNOWLEDGE INCLUDES FAMILIARITY WITH TRAVEL PRODUCTS AND DESTINATIONS

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ABSTRACT

Prior product knowledge has been defined either in terms of what people perceive they know about a product or in terms of what knowledge the individual has stored in memory. Product knowledge is intricately linked to involvement. A consumer's level of involvement and knowledge clearly influence many purchasing decisions. The knowledge deficit regarding these factors is that no studies can be found that evaluate online travel planning in the leisure sector with regards to consumers' travel knowledge. A valid question to ask for instance is what constitutes travel product knowledge? Qualitative research discovered that respondents used the terms 'travel products' and 'travel destinations' interchangeably when referring to their knowledge of travel. To examine travel knowledge more closely, a survey was designed including six questions about travel knowledge with some questions referring to 'products' and others to 'destinations'. Confirmatory factor analysis of the construct travel product knowledge was used to assess the underlying variable that is reflected when respondents refer to knowledge of travel products and destinations.

JEL: M31, D10, D81, D83

KEYWORDS: Decision Process, Factor Analysis, Leisure Travel, Product Knowledge, Travel Products

INTRODUCTION

Consumer knowledge is a key construct in understanding how consumers behave (Brucks, 1985; Duncan & Olchavsky, 1982; Johnson & Russo, 1984; Park, Mothersbaugh, & Feick, 1994; Rao & Munroe, 1998). Travel knowledge was deemed an important variable in explaining online leisure travel booking behavior (Conyette, 2010; Conyette, 2011). Moreover, the travel sector which has unique characteristics of its own, warrants continued examination by researchers since the sector forms a significant part of the economy. According to the World Travel and Tourism Council (WTTC), travel and tourism represents US$7.0 trillion (2013 figures) in economic value, provides 266 million jobs and accounts for US$754 billion in investment. Furthermore, travel and tourism's contribution equates to 9.5% GDP of the world's total economy, 1 in 11 of the world's total jobs, and 4.4% of total investment (WTTC, 2013). Typical studies on product knowledge revolve around comparisons of expert versus novice consumers, how they vary in their information search behavior, their differing priorities and attitudes to advertisements (Chuang, Tsai, Cheng, & Sun, 2009; Hadar, Sood, & Fox, 2013; Myungwoo, Jing, & Lee, 2012). The role of memory in knowledge acquisition, a means-end chain in forming personal relevance, and the interconnections of involvement are other concepts frequently discussed in further research papers (Long-Yi & Chun-Shuo, 2006; Clarkson, Janiszewski, & Cinelli, 2013).

Despite these investigations, very few studies examine online travel planning in the leisure sector and none can be found with regards to consumers' travel product knowledge in particular. In this paper, the author uses factor analysis of the construct travel knowledge to establish that respondents equate knowledge about travel products with knowledge about destinations. This appears to be a unique contribution to the field of

travel research. The next section of this paper describes some relevant literature, followed by a discussion of the data and methodology used in the study. The results are presented and the paper closes with concluding remarks.

LITERATURE REVIEW

Clarkson, Janiszewski, & Cinelli (2013) found that novice consumers usually have no prior consumption experience in a product category and consequently have little knowledge about the array or range of experiences available within a domain. Expert consumers on the other hand should already have fairly broad consumption knowledge and therefore should prefer to enhance their depth of consumption knowledge in a product category. Researchers conducted several experiments to demonstrate that consumers try novel consumption experiences to build their experiential consumption knowledge, knowledge they believe will enhance their appreciation of future consumption experiences. Novice consumers selected consumption experiences that provided valuable breadth consumption knowledge whereas expert consumers chose consumption experiences that provided depth consumption knowledge.

Jensen (2012) conducted an Internet survey based on a questionnaire about travel purchases. Travel experience was shown to be the main predictor of online travel shopping (search and purchase). Travel experience acts directly through its influence on the traveler's perceived risk of online purchasing and indirectly through its influence on a traveler's orientation toward personalizing the travel product. Data analysis shows that more experienced travelers need less information before buying their vacation. Furthermore, the high-experienced traveler is more interested in personalizing the travel product, perceives less risk in doing so, and they are more likely to be a frequent traveler.

Prior product knowledge has been defined either in terms of what people perceive they know about a product (subjective knowledge) or in terms of what knowledge the individual has stored in memory (objective knowledge) (Brucks, 1985; Rao and Munroe 1988). Past studies reveal that knowledgeable consumers are more likely to search for new information before making a decision (Duncan & Olchavsky, 1982; Johnson & Russo, 1984; Punj & Stalein, 1983). Less knowledgeable consumers are more likely to rely on attributes such as brand name, price (Park & Lessig, 1981) or opinions of others (Brucks, 1985; Furse, Punj and Stewart, 1984).

Consumers can combine the three types of product knowledge to form a simple associative network called a means-end chain (Guttman, 1982). A means-end chain typically links consumers' knowledge about product attributes with their knowledge about consequences and values. The means-end chain model proposes that the meaning of a product attribute is given by its perceived consequences (Mehrotra & Palmer, 1985). Means-end chains help marketers understand consumers' feelings of personal relevance for a product because they clearly show how consumers' product knowledge is related to their knowledge about self (Walker & Olson, 1991). The type of means-end knowledge activated in the situation determines the level of product involvement a consumer experiences during decision-making. Consumers will feel more involved with the product if they believe product attributes are strongly linked to important end goals or values. Consumers who experience little or no involvement with the product believe the product attributes are not associated with any relevant consequences.

Involvement refers to consumers' perceptions of importance or personal relevance for an object, event, or activity (Krugman, 1965). Involvement is a motivational state that energizes and directs consumers' cognitive and affective processes and behaviors as they make decisions (Cohen, 1982). Involvement has also been referred to as an internal state variable that indicates the amount of arousal, interest, or drive invoked by a particular stimulus or situation (Andrews, Durvasula, and Akhter, 1990). Consumers who perceive that a product has personally relevant consequences are said to be involved with a product and have a personal relationship with it. Cognitively, involvement includes the means and knowledge about

important consequences produced by using the product. People may express stronger affective responses such as emotions and strong feelings if product involvement is high. Highly involved consumers constantly collect information about a product of interest (Bei & Widdows, 1999).

A person's level of involvement is influenced by two sources of self-relevance: intrinsic and situational. Intrinsic self-relevance is based on consumers' means-end knowledge stored in memory (Block, 1982). As consumers use a product or observe others using it they learn that certain product attributes have consequences that help achieve important goals and values. Because this means-end knowledge is stored in memory, it is a potential intrinsic source of involvement. If this involvement is activated in a decision situation, the consumer would experience feelings of personal relevance or involvement with the product. Aspects of the immediate physical and social environment that activate important consequences and values, determine situational relevance thus making products and brands seem self-relevant.

A key to good marketing management comes from understanding a consumer-product relationship and when marketers understand this relationship they will be able to segment the market accordingly. Different marketing strategies are necessary to address the unique types of product knowledge, intrinsic self-relevance, and involvement of consumers in different market segments. A consumer's level of involvement and knowledge clearly influence all purchasing decisions. The knowledge deficit regarding these factors is that none of the studies on these topics evaluate online travel planning in the leisure sector. Neither do they assess the construct of travel product knowledge to determine whether people equate knowledge about travel products with knowledge about destinations.

DATA AND METHODOLOGY

A larger study in 2008 by this writer whose purpose was to discover the factors influencing online leisure travel planning decisions, used qualitative research with focus groups, personal interviews, and case studies. One of the factors that impacted online leisure travel decisions was a person's knowledge of travel. The larger study revealed that respondents used the terms 'travel products' (hotels, airlines, cruises, tours, etc.) and 'travel destinations' interchangeably when referring to their knowledge of travel (Conyette, 2010). To confirm whether this is the impression consumers have of travel knowledge, data was collected in 2008 using an online questionnaire to test the construct of travel product knowledge and determine if respondents were referring to the same thing. A total of 1300 online surveys were submitted by consumers through various businesses listed in the acknowledgements below.

One hundred and two surveys were deleted, since responses were not complete, leaving 1198 completed surveys for data analysis. The survey was pre-tested after 250 surveys were collected. A common approach for data reduction is the factor analysis method that seeks to determine the underlying unobservable (latent) variables that are reflected in the observed (manifest) variables. This author uses the term *factor analysis* generically to encompass both principal components and principal factors analysis. In designing a survey questionnaire to examine the factors influencing online travel purchasing behavior, questions about travel knowledge referred to 'products' and then also to 'destinations'. Principal components analysis of six Likert scale questions from the questionnaire using the data gathered from the respondents was performed with SPSS.

For a product class knowledge scale, three items from Park, Mothersbaugh & Feick (1994) were used on a 7-point Likert scale ranging from very familiar to very unfamiliar. Some items were merged due to the low number of responses in that category. Merging categories is sometimes done to more evenly distribute data so that it reflects a meaningful distinction between categories in practical terms. Categories in the other variables were unchanged. Thus, the first two 'knowledge' questions - How much do you feel you know about travel products? And compared to your friends and acquaintances? used five categories 1= very familiar, 2=familiar, 3=a little familiar, 4=neutral, 5=a little unfamiliar. The third knowledge question

(comparing to a travel agent) kept all seven categories, 1= very familiar, 2=familiar, 3=a little familiar, 4=neutral, 5=a little unfamiliar, 6=unfamiliar, 7=very unfamiliar.

RESULTS

The six travel knowledge questions from the survey are shown in Table 2 below. Table 1 and Figure 1 also show components resulting from the analysis. In Table 1, Principal Components Analysis reveals the presence of one component with an eigenvalue exceeding 1, explaining 72% of the variance. The eigenvalue of a factor represents the amount of total variance explained by that factor. The Kaiser criterion recommends keeping for further investigation only factors with an eigenvalue of 1.0 or more. This was further supported by the results of Parallel Analysis, which showed only one component with an eigenvalue exceeding the corresponding criterion value for a randomly generated data matrix of the same size (6 variables x 1198 respondents).

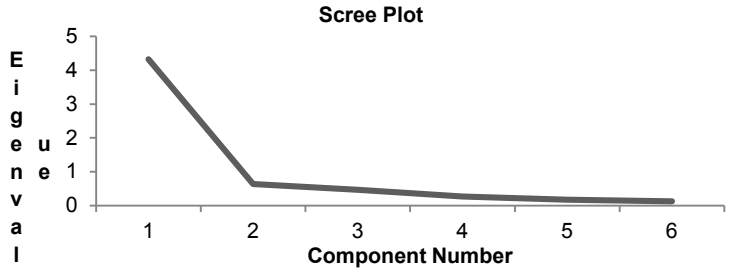
Table 1: Total Variance Explained

Initial Eigenvalues		
Total	% of Variance	Cumulative %
4.320	71.995	71.995
0.637	10.617	82.612
0.468	7.792	90.404
0.272	4.534	94.938
0.175	2.921	97.859
0.128	2.141	100.000

This table shows Extraction Method: Principal Component Analysis. The presence of one component is clear with an eigenvalue exceeding 1, explaining 72% of the variance. All other components explain a total of 28% variance in items. The Kaiser criterion recommends keeping for further investigation only factors with an eigenvalue of 1.0 or more.

An inspection of the scree plot shows a clear break after the first component; this dominance is seen in Figure 1. The well accepted Catell's scree test recommends retaining all factors above the elbow since they explain most of the variance in the dataset.

Figure 1: Scree Plot



This figure shows one dominant component and a clear break after the first component. Catell's scree test recommends retaining all factors above the elbow since they explain most of the variance in the dataset.

Table 2 below shows that the six items all relate to one component, knowledge of travel. Since one component is extracted the solution cannot be rotated. The close range of loading values from 0.803 to 0.873 shows that respondents answered all six questions in a similar fashion so that for example, where they indicated 'very familiar' with one question they responded to other questions in a comparable way. Overall these results support the uni-dimensionality of the data.

Table 2: Component Matrix[a]

	Component
	1
Compared to your friends and acquaintances, how much do you feel you know about travel destinations?	0.873
Compared to a travel agent, how much do you feel you know about travel products?	0.865
Compared to a travel agent, how much do you feel you know about travel destinations?	0.863
Compared to your friends and acquaintances, how much do you feel you know about travel products?	0.846
How much do you feel you know about travel destinations?	0.839
How much do you feel you know about travel products?	0.803

This table shows Extraction Method: Principal Component Analysis, with 1 component extracted. A Rotated Component Matrix[a] indicates that only one component was extracted. The close range of loading values from 0.803 to 0.873 shows that respondents answered all six questions in a similar way. Overall these results support the uni-dimensionality of the data.

In Table 3, an examination of the Kaiser-Meyer Olkin measure of sampling adequacy suggests that the sample was factorable (KMO = 0.824) above the recommended value of 0.60. Bartlett's test of sphericity was significant ($C^2 = 5648.306$, $p < 0.001$). Both of these statistical measures generated by SPSS address the strength of inter-correlations among items and show that factor analysis is appropriate given the data. Principal Component Analysis requires that the probability associated with Bartlett's Test be less than the level of significance and the probability is less than 0.001 which satisfies this requirement.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.824**
Bartlett's Test of Sphericity	Approx. Chi-Square	5,648.306
	df	15
	Sig.	0.000

This table displays Kaiser-Meyer-Olkin 0.824 above the recommended value of 0.60. Bartlett's test of sphericity was significant ($C^2 = 5648.306$, $p < 0.001$). These statistical measures address the strength of inter-correlations among items and show that factor analysis is appropriate given the data.

Analysis indicates that respondents were not confused with the six questions asking their knowledge of travel products and destinations. They showed consistent responses demonstrating they equate knowledge about travel products with knowledge about destinations. Factor analysis of the construct product knowledge confirmed this assertion as can be seen in the total variance and scree plot above. The factor knowledge of travel is the same as knowledge about travel products and about destinations. Factor analysis is appropriate for the data and reveals useful insights into the construct of travel knowledge.

CONCLUSION

There are no known studies that have evaluated online travel planning in the leisure sector with regards to consumers' travel knowledge. The goal of this paper is to initiate this discussion since travel knowledge was deemed an important variable in explaining online leisure travel booking behavior (Conyette, 2010; Conyette 2011). Since respondents during qualitative research used the terms 'travel products' and 'travel destinations' interchangeably when referring to their knowledge of travel, it was thought to check this through confirmatory factor analysis. An online survey was used to gather data required for assessing the construct of travel knowledge. Factor analysis suggests that respondents are referring to the same thing when they describe their familiarity with travel; it is the same as knowledge about travel products and destinations. This research makes a contribution to the body of knowledge by offering some understanding of what constitutes travel product knowledge.

Relevant limitations in this study are that survey respondents expressed their intention to search travel online but these do not necessarily reflect enduring behavioral patterns of subjects. The survey instrument was administered on the Internet. Subjects were referred to the website which included the survey and appropriate instructions. Every respondent saw the same questionnaire and had the same instructions to guide them. Although the survey was pretested it is difficult to determine if participants fully understood the questions asked. In addition, consumers without much Internet experience most likely did not complete the survey. Future research will examine how consumers use mobile devices and wearable tech devices in travel and therefore product knowledge will include familiarity with such devices and how they assist travelers.

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CONSUMERS' AWARENESS ON THEIR EIGHT BASIC RIGHTS: A COMPARATIVE STUDY OF FILIPINOS IN THE PHILIPPINES AND GUAM

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ABSTRACT

This study considers Filipino consumers living in two different places and the degree to which they are aware of the eight basic consumer rights and whether there are significant differences in their level of awareness. The eight consumer rights are: Right to basic needs, Right to safety, Right to information, Right to choose, Right to representation, Right to redress, Right to consumer education, and Right to healthy environment. Findings show moderate overall degree of awareness of both Filipinos living in their own country and those living in Guam. No significant difference was observed as to their overall awareness on the eight basic rights. However, significant differences were manifested in three rights: basic needs, information and choice. Filipinos living in Guam have low awareness on their right to choose and right to information while Filipinos in the country showed moderate awareness on all other rights except for right to safety.

JEL: D11, M31

KEYWORDS: Consumer Awareness, Consumerism, Consumer Rights

INTRODUCTION

Consumers, by definition, include us all; they are the largest economic group, affecting and affected by almost every public and private economic decision. Yet theirs is the only important group whose views are often not heard (Kennedy, 1962). Consumption refers to anything a person needs for survival. It starts from a person's birth until they end up in grave. People buy and consume a variety of goods and services everyday. Hence, consumers are the largest economic group and central point of all marketing activities (Gupta and Panchal, 2009).

Self-effort on the part of consumers for safeguarding themselves is known as "consumerism" (Cravens and Hills, 1970). Consumerism is an outcome of sufferings and exploitation of the consumers by market forces. Technological innovations have brought about a revolution in every sector creating a variety of products. It is a challenge to the consumer to purchase the products when s/he enters into the market. It is therefore necessary for the consumers to be aware of their legitimate rights during and after purchases (Bhatt, 1995). Consumer rights gained importance in the world at the advent of the 20th century. The rights of consumers got international recognition when in 1985 the UN promulgated the basic guidelines regarding consumer rights protection. The UN guidelines said that "*all citizens, regardless of their incomes or social standing, have basic rights as consumers*" (Subedi, 2007). The consumer movement now marks March 15 every year as a day of raising global awareness about consumer rights.

In developing countries like the Philippines, where rights are sometimes ignored and taken for granted, it is hard to speculate how many Filipinos are aware of their rights as consumers. While concern for the welfare and protection of consumers is rising locally, data on public perception about their basic consumer rights are limited. The psychology of the typical Filipino consumer has been the result of many factors in their cultural environment. The behavior of Filipino consumers changes in a degree commensurate to social revolution. The tastes, motives, habits and values of present day Filipino consumer are actually the products of acquired post-Spanish (1565) and American cultures (Del Rosario, 1961). The needs and roles of the Filipino consumers are deeply rooted in their value patterns. This behavior is aimed at social acceptance, economic security, and social mobility (Roces, 1961).

In response to the ASEAN initiatives for consumer protection, the Philippines passed into law on April 13, 1992 Republic Act 7394, also known as "The Consumer Act of the Philippines" geared towards controlling fraudulent trade practices to protect the interest of the consumers, promote their general welfare, and establish standards of conduct for business and industry. The National Consumer Affairs Council (NCAC) was created by R.A. 7394 which composed of representatives from the government, consumer organizations, and business/industry sector to improve the management, coordination and efficacy of consumer programs.

However, it is unclear to what extent these laws have created an awareness of these basic rights among Filipinos. One way of determining this would be to compare Filipinos living in the Philippines with Filipinos living in a different location where a higher awareness of these rights might be predicted. One such location is Guam, which has a significant population of Filipinos, but where awareness of consumer rights might be higher as a result of it being a territory of the United States.

Guam is an island in the Western Pacific Ocean, located around 1,500 miles to south of Japan, 1,400 miles to east of Philippines, 2,000 miles to north of Australia, and 3,800 miles to west of Hawaii. It is the largest and southernmost of the islands that form a part of the Marianas Island. It is an unincorporated territory of United States since 1950 and shares most of the rights of Americans (iloveindia.com/lounge/fact-about Guam, July 27, 2012). Guam is approximately 3 1/2 hours away from the Philippines. The climate is almost the same as that of the Philippines between 75 and 86 degrees of Fahrenheit. The Philippines is accessible to Guam. While Filipinos need a US visa to visit Guam, Guam residents can visit the Philippines for 14 days without a visa. Residents of Guam avail themselves of this privilege to get medical treatment in the Philippines. Most of these visitors will shop while undergoing medical examinations and treatment.

Majority of the Filipinos in Guam migrated from the Philippines. Almost 26.3% of the entire Guam population of 159,358 (2010 US Census) are Filipinos. Filipino consumers in Guam could be influenced by fusions of several cultures such as Americans, Asians, and other Micronesian islands that predominates the population. This study compared the degree of consumers' awareness between Filipinos living in the Philippines and in Guam on their eight basic consumers' rights. Specifically, this study determined if there are significant differences in their degree of awareness.

LITERATURE REVIEW

Literature, studies and data on public perception about basic consumer rights are limited. Two unpublished articles on consumerism were written by Ibarra in 1987 and in 1998. One pertains to an inter-industry analysis on the awareness of three manufacturing companies on the seven basic consumer rights and another study compares awareness of pharmaceutical companies in Belgium and in the Philippines to the basic rights of consumers. This study is different from previously conducted research because it focuses on the consumers; it will determine the consumers' awareness of their eight basic rights.

The review of literature presented below is limited to the eight basic consumer rights as defined by Consumers International (2011) and adopted by the National Consumer Affairs Council of the Department of Trade and Industry in the Philippines are presented below. *Consumer awareness* is referred to as the perception or understanding of these rights by consumers.

The first right refers to basic needs. This right ensures availability of basic goods and services to consumers at affordable prices and of good quality. It includes adequate food, clothing, shelter, health care, education, public utilities, water and sanitation to lead a decent life. Based on these human needs, the United Nations Guidelines on Consumer Protection defines *sustainable consumption* as including "meeting the needs of present and future generations for goods and services in ways that are economically, socially and environmentally sustainable" (United Nations, 1999). The Universal Declaration of Human Rights in 1948, Paris (Article 25), as cited by United Nations Educational Scientific and Cultural Organization (UNESCO) further signifies that "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services..."

The second right pertains to safety. This right assures consumers to be protected against marketing of goods which are injurious to health and life. Consumers are assured that manufacturers of consumer products undertake extensive safety and performance testing before selling their products in the market. Products should be properly labelled with information as to the contents, use, precautions or warning signs and how to prepare it, if the need arises.

Wilson (2008) argues that consumers have the right not only to expect protection from hazardous products and services purchased in the marketplace, particularly if used properly for their intended purpose but also the right to be protected from the sale and distribution of dangerous goods and services. On the other hand, Dumalagan (2004) emphasizes that all consumers are entitled to safety against the marketing of goods or the provision of services that are hazardous to their health and life. She supports that economic globalization may benefit the consumers as a consequence of the expanding circulation of goods and services, thus, enhancing their right of choice, based on needs and purchasing power. Conversely, it may also create certain uncertainty about their safety. As Harland (1990) declares, the capacity of goods and services to cause serious injury or death has vastly increased as consumers are often faced with inadequate information to assess whether these goods and services conform to basic safety requirements.

The third is the right to information. This is the right of consumers to be protected against dishonest or misleading advertising or labelling and the right to be given the facts and information needed to make an informed choice. Consumers have the right to receive adequate information about products on which to base buying decisions. Information to consumers includes product specification, place of origin, safety warnings, price, mode of payment, date of quality assurance, description of after-sale services, warranty, ingredient, nutritional facts, etc. Consumers expect complete information about the product to be purchased including its use, ingredients or chemical contents, limitations and expiry date. Consumers must be informed about the safety precautions to be taken while using the product to avoid loss or injury. Limited information is one of the factors causing exploitation of consumers.

Aaker and Day (1978) cited the right to be informed as a fundamental economic interest of the consumer. They believe that consumers should be provided with sufficient information to make wise purchase decisions. Information should not be persuasive as shown by commercials, but should be informative. At present, products are massive in quantity and more complicated to assess. Against this numerous products are lay buyers who do not have the time or the capacity to obtain information to help them in making the correct decision to buy. Along this line, Peter and Olson (2005) demonstrated that a substantial amount of marketing information is miscomprehended in that consumers form inaccurate, confused or

inappropriate information interpretation. The type of miscomprehension can vary from confusion over similar brand names to misinterpreting a product claim by forming an inaccurate means-end chain.

The fourth is the right to choose. This deals with the right to choose products and services at competitive prices, with an assurance of satisfactory quality. Consumers expect a wide array of goods and services which are offered in the market with diverse brands, sizes, shapes, colors and with differences in the price, quality and use. Consumers have the right to be assured that a selection of quality products and services are available for them to purchase at competitive prices. The right to choose also intends to protect competitors from each other, particularly the small firms from the large and powerful ones.

According to Wilson (2008) a consumer should have the opportunity to select the goods or services that he or she wants to purchase. Gupta and Panchal (2009) pointed out that with the rise in the income of people, the quality, quantity and sophistication of the consumer goods has also increased. They believe that the market literally overflows with new products based on intricate technology thus making it very difficult for the consumer to select an item because of misleading advertisements and improper media emphasis as well.

The fifth right refers to representation. The right to representation is also known as the right to be heard. This is the right to express consumer interest in the making and execution of government policies that will have an impact on the supply of goods and services to consumers. Consumers expect legislators would propose laws that would ensure that consumers would have the chance to live a better life by getting the best value for their hard-earned money. Consumers have the right to equal and fair consideration in government policy-making situations, as well as prompt treatment in administrative courts or legal communities. Consumers have the right to complain when there are problems or concerns. The right to be heard involved an assurance that consumer would be considered in the formulation of government policy and during regulatory proceedings. Some business enterprises advocate this consumer right in formulating their policies (Aaker and Day, 1978).

The sixth is the right to redress. This is the right of consumers to be compensated for misrepresentation, shoddy goods or unsatisfactory services. Under this right, consumers expect defective goods to be replaced or money refunded by the seller or dealer. Consumers also have the right to seek legal remedies in the appropriate courts of law. Through this right, the consumers are assured that their complaints will receive due attention. This right also provides for due compensation to consumers if they have suffered a loss or are put to jeopardy due to the fault of the supplier or manufacturer. Aaker and Day (1978) pointed out that consumers should be given an opportunity to voice dissatisfaction and complaint is settled satisfactorily. A variety of innovations, including free legal service for the poor, consumer class action suits, and arbitration procedures have substantially enhanced the right to recourse and redress, or to fair settlement of just claims.

The seventh right pertains to consumer education. This is the right to acquire the knowledge and skills necessary to be an informed consumer. Consumers may look forward to the three sectors of society: business, government and consumer would embark on an information campaign through tri-media on consumer-related issues as well as series of seminars, conferences, for training and public hearings for the welfare of consumer. To prevent market malpractices and exploitation of consumers, consumer awareness and education are essentially required. Recognizing the importance of consumer education, Singh (2002) lays down four important aspects: (a) Informed Choice- Consumers must learn to obtain information on goods and services, discriminate between sources of information, understand the psychology of selling and advertising; (b) Value Systems- Consumer education must enable the consumer to understand that individual consumer decisions have a broad social impact and influence on such important things as the overall allocation of resources within the society; (c) Wise Decision Making- Consumers need information to make careful, wise decisions and informed choices; and, (d) Catalyst for Action-

Consumers must be aware of the available avenues of consumer complaint and redress and learn to use them for their benefit. In addition, Prajapati et al. (2009) acknowledges the help of consumer education in making wise choice especially in developing countries where it becomes more important because there is variety of products and there is little control over standards.

Lastly, *the eight right concerns a healthy environment.* This right assures consumers to live and work in an environment which is neither threatening nor dangerous and which permits a life of dignity and well-being. Consumers expect the government exerting effort regarding the alarming increase in the degradation of the environment especially on forest, dying wildlife, depleted land fill space and environmental contamination to prevent further damage and the constant monitoring of our seas, coral reefs, forest and waste disposal being committed by factories to check if there is a violation of the laws on environmental protection. Dumalagan (2004) emphasizes that all consumers are entitled to a healthy environment and should be protected from the devastating effects of air, earth, and water pollution that may affect the performance of daily marketplace operations. Consumers have the right to live and work in an environment that does not threaten the well-being of present and future generations.

DATA AND METHODOLOGY

The questionnaire was adopted from the survey instrument used by Ibarra (1987, 1998), modified by Revilla (2012) and further modified by these researchers for consumers in Guam. The questions were structured using 4 point Likert type scales. The researchers involved enumerators to conduct the survey during the months of October and November 2011. Respondents were all 18 years old and above. The sample size was determined using Slovin's formula (Guilford and Fruchter, 1973).

Guam has a population of 159,358. Chamorro is the largest social-cultural group in Guam about 37.1% of the population followed by Filipinos representing 26.3%. Approximately 64.6% are 18 years old and above. Using Slovin's formula at 10% margin of error, Guam sample size is 100. Guam respondents were purposely selected based on their being a Filipino by birth or by blood. Two hundred (200) questionnaires were distributed to household consumers with 143 questionnaires returned that were properly answered and considered.

In the Philippines, the survey was conducted in San Pablo City, one of the country's oldest cities in the Province of Laguna with a population of 237,259 (2007 Philippine Census Information). The total number of population is comparable to the population of Guam. The participants of the study composed of consumers from four selected supermarkets in San Pablo City. The researchers utilized purposive sampling in the selection of supermarket with over 2,300 customer-volumes per day. Participants were selected based on their willingness to answer the survey. The sample size of 440 was determined using the Slovin's formula at 10% margin of error. Number of questionnaires used was limited to 500.

Responses were tabulated and weighted. The computed weighted means determined the level of agreement and awareness. Two-population hypothesis t-test, assuming unequal variances exist, was used considering the eight rights as the variables. The computed P value determined the level of significance.

RESULTS

The degree of consumers' awareness on their eight (8) basic rights is presented below. The scale ranges and equivalent of the responses are presented in Appendix B. This will facilitate interpretation and analysis of the data gathered.

The five statements to test consumers' awareness on their right to basic needs and five statements to determine consumers' awareness pertaining to safety are presented in Table 1. Both groups showed a

moderate awareness to right to basic goods; Filipinos in the country had a higher mean of 3.76 as against 3.5 of Filipinos in Guam. Both groups of respondents show "low" awareness on their right to safety with an equal weighted mean of 3.12 for Filipinos in Guam and in the Philippines respectively.

Table 1. Right to Basic Needs and Right to Safety

		GUAM (n=143)		**PHILIPPINES** (n=440)	
A. RIGHT TO BASIC NEEDS		**WM**	**Degree of Awareness**	**WM**	**Degree of Awareness**
A1	Store offers the basic goods that you need.	4.14	Moderate	4.27	High
A2	Store offers the basic goods at a fair price.	3.50	Moderate	4.01	Moderate
A3	Store is able to raise the prices of goods anytime they want to.	3.18	Low	3.44	Moderate
A4	You can complain to the store if they do not have what you need.	3.21	Low	3.46	Moderate
A5	You can complain to the store if their prices are unreasonable.	3.49	Moderate	3.63	Moderate
	Average	**3.50**	**Moderate**	**3.76**	**Moderate**
B. RIGHT TO SAFETY					
B1	Majority of the goods that you buy have safety precautions.	3.75	Moderate	3.82	Moderate
B2	There are goods in the store that are harmful to health.	1.96	Very low	2.66	Low
B3	You can return goods to the store that are expired or obsolete.	3.38	Low	3.68	Moderate
B4	Store sells substandard products that wear out/expire easily.	3.40	Low	2.72	Low
B5	You do not know if the products you are buying are safe or not.			2.73	Low
	Average	**3.12**	**Low**	**3.12**	**Low**

This table shows the weighted mean (WM) and the degree of awareness of the respondents to the statements pertaining to "right to basic needs" and "right to safety". The questions were structured using the Likert format. Responses were given weight from 1 to 4 points. Scales are shown in appendix B. B5 was considered "sensitive" question in Guam and was omitted in the questionnaire.

Filipino consumers in Guam agreed on three statements: that stores offer a wide variety of basic goods at fair prices and that they can complain if the prices are unreasonable. They were not certain if the stores can raise the prices of goods anytime they want to or they can complain to the store if they do not have what they need. Consumers in the Philippines strongly agreed that stores offer a wide variety of basic goods they need basically at a fair price. They even concurred that they can complain if the stores do not have what they need and if the prices are unreasonable. Almost half of the participants believed that the stores can raise the prices of goods anytime.

Both groups agreed that goods in the stores have safety precautions as shown in Table 1. Filipino consumers in Guam agreed that there are goods in the stores that are harmful to their health. They are not sure if they can return goods to the store that are expired or obsolete and are also uncertain if stores sell substandard products that wear out or expire easily. Consumers in the Philippines believed that the goods they buy have safety precautions and confirmed that they can return goods to the store if found expired or obsolete. They were not aware if stores sell products that are detrimental to health and sell low quality products that deteriorate or expire easily. Filipino consumers were unsure if the products they buy are safe or not while Filipino consumers in Guam provided no definite answer.

The five statements to find out the consumers' awareness on their right to information and five statements to check the consumers' awareness on their right to choose are shown in Table 2. The degree of awareness to right to information of Filipino consumers in Guam is "low" as compared to "moderate" by Filipino consumers in the Philippines. Filipinos consumers in Guam show "low" awareness to right to choose with a weighted mean of 3.38 while Filipinos consumers in the Philippines manifest "moderate" awareness to this right with a weighted mean of 3.65.

Table 2 Right to Information and Right to Choose

		GUAM (n=143)		**PHILIPPINES** (n=440)	
C. RIGHT TO INFORMATION		**WM**	**Degree of Awareness**	**WM**	**Degree of Awareness**
C1	Goods/products are properly labeled (expiration date, etc.) and contents properly indicated.	3.87	Moderate	3.93	Moderate
C2	The label gives enough facts and information about the products to enable consumer to make wise decision in purchasing.	3.76	Moderate	3.85	Moderate
C3	Advertisement usually presents a true picture of the products advertised.	2.61	Very low	3.50	Moderate
C4	Advertised products are generally more dependable than unadvertised products.	2.94	Low	3.45	Moderate
C5	Product warranties or guaranties are properly explained to you.	2.94	Low	3.38	Low
	Average	**3.23**	**Low**	**3.62**	**Moderate**
D. RIGHT TO CHOOSE					
D1	Store offers wide variety of product for consumers to choose from.	3.75	Moderate	4.13	Moderate
D2	Wide variety of products makes intelligent buying difficult.	3.02	Low	3.58	Moderate
D3	You choose highly priced goods because they are better in quality.	3.22	Low	3.53	Moderate
D4	Advertisement influences your choice of what goods to buy.	3.80	Moderate	3.68	Moderate
D5	Store's salesperson influences your choice.	3.10	Low	3.35	Low
	Average	**3.38**	**Low**	**3.65**	**Moderate**

This table shows the weighted mean (WM) and the degree of awareness of the respondents to the statements pertaining to "right to information" and "right to choose". Both rights show differences in the degree of awareness: "Low" for Guam and "moderate" for Filipinos in the Philippines.

Table 2 shows that both groups believed that stores have done their part to ensure proper product labeling. The respondents disclosed that goods/products are properly labeled and contents properly indicated, and that labels give enough facts and information about the products to enable them to buy wisely. Filipino consumers in Guam, however, do not agree that advertisements present the true picture of the products advertised. They were not convinced that products advertised are generally more dependable than unadvertised products. They were not even certain that product warranties are properly explained to them. Filipinos in the Philippines manifested the same uncertainty with regard to this statement. The moderate responses of Filipinos in the Philippines for statements C3 and C4 signified their belief that advertisement usually presents a true picture of the products advertised and advertised products are more dependable than unadvertised ones.

Table 2 further shows that both group of consumers believed that stores offer wide variety of products to choose from and advertisements influence their choice of what goods to buy rather than the "sales talk" that they normally receive from the store's salesperson. Filipinos consumers in Guam and in the Philippines differed in their responses to two statements. Consumers in Guam were not convinced that a wide variety of products makes intelligent buying difficult and that they will choose highly priced goods because they are better in quality. Filipino consumers in the Philippines were in agreement that the stores offer wide variety of product for consumers to choose from; however, this made it difficult for them to buy wisely. Majority of the respondents favored high quality products even if these goods command higher price.

The six statements to assess the consumers' awareness on their right to representation and four statements to measure the consumers' awareness on their right to redress are enumerated in Table 3. Filipino consumers in Guam and in the Philippines show "moderate" awareness of the right to representation, with

3.50 weighted mean and 3.61 respectively. Both groups manifest the same level of awareness on right to redress with Filipino consumers in the Philippines showing a slightly higher weighted mean.

Table 3 Right to Representation and Right to Redress

		GUAM (n=143)		**PHILIPPINES** (n=440)	
E. RIGHT TO REPRESENTATION		**WM**	**Degree of Awareness**	**WM**	**Degree of Awareness**
E1	You know where to go if you have a complaint.	3.73	Moderate	3.70	Moderate
E2	You know what to do if you have a complaint.	3.62	Moderate	3.66	Moderate
E3	Store is more sensitive to consumers' complaints now than in the past.	3.65	Moderate	3.56	Moderate
E4	When you have problems with products you have purchased, it is usually easy to return them.	3.12	Low	3.51	Moderate
E5	The store's policy in handling complaints and settling grievances of consumers are satisfactory.	3.34	Low	3.52	Moderate
E6	Store has "Consumers' Service Desk."	3.57	Moderate	3.70	Moderate
	Average	**3.50**	**Moderate**	**3.61**	**Moderate**
F. RIGHT TO REDRESS					
F1	Store encourages return of products if consumers are not satisfied.	3.02	Low	3.42	Moderate
F2	The quality of service provided by store to complaining customers is getting better.	3.45	Moderate	3.60	Moderate
F3	Store is willing to replace defective product complained about.	3.67	Moderate	3.63	Moderate
F4	You are generally satisfied with the store's response when complaining about defective product and ask for reimbursement of your money.	3.57	Moderate	3.43	Moderate
	Average	**3.43**	**Moderate**	**3.52**	**Moderate**

This table shows the responses to "right to representation" and "right o redress"; weighted mean (WM) for both rights show "moderate" as their level of awareness.

Table 3 shows that respondents are in agreement with the four statements under this right. All the four statements under this right have moderate degree of awareness. Apparently, the participants have been mindful of their rights in the market place since they know where to go and what to do if they have a complaint. Likewise, the participants' observed that the stores are more sensitive to consumers' complaints now than in the past. They concurred that the stores have "Consumers' Service Desk" indicating the stores' compliance with regulatory requirements. Guam and Philippine respondents, however, differed in two statements. Filipino consumers in the Philippines agreed that when they have problems with products they purchase, it is usually easy for them to return it while Filipino consumers in Guam are not certain they can return the products. Respondents from the Philippines believed that stores policies in handling complaints and grievances are satisfactory while respondents from Guam are not sure at all.

As to their right to redress, Filipino consumers in Guam are not certain if stores encourage return of products if consumers are not satisfied with the products, while Filipinos agree that stores in the Philippines encourage consumers to return products if they are not satisfied. Both group of consumers acknowledged that the quality of service provided by store to complaining customers is improving; respondents also agreed that stores are willing to replace defective product complained about. Majority of the participants were satisfied with the store's response when they complain about defective product and when asking for a refund.

The two statements to evaluate the consumers' awareness on their right to consumer education and three statements to gauge consumers' awareness on their right to a healthy environment are detailed in Table 4. Both groups of consumers manifest "moderate" awareness of the right to consumer education and show the same level of "moderate" awareness to right to a healthy environment.

Table 4 Right to Consumer Education and Right to Healthy Environment

		GUAM (n=143)		**PHILIPPINES** (n=440)	
G. RIGHT TO CONSUMER EDUCATION		**WM**	**Degree of Awareness**	**WM**	**Degree of Awareness**
G1	You welcome laws that will protect consumers against malpractices in the market place.	4.29	High	4.07	Moderate
G2	You will participate in seminars on consumers' education.	3.38	Low	3.87	Moderate
	Average	**3.84**	**Moderate**	**3.97**	**Moderate**
H. RIGHT TO A HEALTHY ENVIRONMENT					
H1	You consider environmental pollution a major responsibility of the business establishments.	4.10	Moderate	4.04	Moderate
H2	You will pay higher prices for products that will cause less environment pollution.	3.40	Low	3.40	Low
H3	Business establishments are concerned about environmental pollution.	3.04	Low	3.79	Moderate
	Average	**3.52**	**Moderate**	**3.74**	**Moderate**

This table shows the responses to "right to consumer education" and "right to healthy environment"; weighted mean (WM) shows "moderate" as their level of awareness. Although both groups of consumers manifest "moderate" awareness to right to consumer education, each shows different degree of awareness to some statements.

As shown in Table 4, Filipinos consumers in Guam strongly welcomed laws that will protect consumers against malpractices in the market place, while Filipino consumers in the Philippines merely agreed to the statement and supported consumer advocacy as evidenced by their willingness to participate in seminars on consumer education. Filipino consumers in Guam were not decided if they will participate in this type of seminars.

Table 4 further shows that both groups of Filipinos show the same level of "moderate" awareness to right to a healthy environment; Filipinos at 3.74 weighted mean, while 3.52 weighted mean for Filipinos in Guam. Filipinos confirmed that environmental pollution is a major responsibility of the business establishments, but were uncertain if they are willing to pay higher prices for products that will cause less environmental pollution. Filipinos likewise believed that business establishments are concerned about environmental pollution. However, Filipinos in Guam are not sure if the same concern applies to business establishments in Guam.

Table 5 summarizes the overall degree of consumers' awareness of Filipino consumers in Guam and in the Philippines on their eight (8) basic rights. Both group of consumers show "Moderate" awareness with an average weighted mean of 3.49 and 3.67 respectively.

As shown in Table 5, in the Philippines the rights to consumer education and safety got the highest and lowest weighted mean of 3.97 and 3.12, respectively. While in Guam, the right to clean environment got the highest mean of 3.52 and the right to safety is the lowest at 3.12. Although the overall degree of consumers' awareness is "moderate" there is difference in their perceptions to two rights; namely, right to information and right to choose.

To measure the differences in the degree of consumers' awareness a two-population hypothesis t-test, assuming unequal variances exist, was used considering the eight rights as the variables. The computed P

value determined the level of significance. Table 6 shows the P-value and the level of differences at 5% to test the hypothesis that: "No significant differences exist in the degree of awareness between Filipinos in the Philippines and Filipinos residing in Guam on their eight basic consumer rights".

Table 5: Overall Degree of Consumers' Awareness

	GUAM (n=143)		**PHILIPPINES** (n=440)	
Rights	**WM**	**Degree of Awareness**	**WM**	**Degree of Awareness**
A. Basic needs	3.50	Moderate	3.76	Moderate
B. Safety	3.12	Low	3.12	Low
C. Information	3.23	Low	3.62	Moderate
D. Choose	3.38	Low	3.65	Moderate
E. Representation	3.50	Moderate	3.61	Moderate
F. Redress	3.43	Moderate	3.52	Moderate
G. Consumer education	3.51	Moderate	3.97	Moderate
H. Clean environment	3.52	Moderate	3.74	Moderate
Average	**3.49**	**Moderate**	**3.67**	**Moderate**

This table summarized the overall awareness of both group of consumers. Note the differences in the awareness on "right to information and right to choose.

Table 6: Overall Awareness to the Basic Consumer Rights

Two-tail t-test on hypothesis (n= 583)			
Consumer Rights		**P-value**	**Differences**
A.	Basic needs	0.019	Significant *
B.	Safety	0.967	Insignificant
C.	Information	0.001	Significant *
D.	Choose	0.021	Significant *
E.	Representation	0.373	Insignificant
F.	Redress	0.368	Insignificant
G.	Consumer education	0.18	Insignificant
H.	Clean environment	0.14	Insignificant
	Overall	**0.159**	**Insignificant**

*5% level of significance, however the level of differences in the overall degree of respondents' awareness is insignificant with a P-value of 0.159.

Although there are no significant differences in the overall awareness, significant differences in the respondents' degree of awareness were present in three basic rights namely: Right to basic needs, right to information and right to choose with a P-value of 0.019, 0.001 and 0.021, respectively. Insignificant differences in the respondents' degree of awareness were evident in the following rights: Right to safety, representation, redress, consumer education, and clean environment with a computed P-value of 0.967, 0.373, 0.368, 0.18 and 0.14, respectively.

CONCLUDING COMMENTS

This study focused on the degree of consumers' awareness of their eight basic rights between Filipinos residing in the Philippines and in Guam. A survey was conducted among 143 Filipinos in Guam and 440

Filipinos in the Philippines, using Likert type questions. Responses were tabulated and weighted. The computed weighted means determined the level of agreement and awareness. Two-population hypothesis t-test, assuming unequal variances exist, was used considering the eight rights as the variables. The computed P value determined the level of significance. Due to time constraint sample size was limited to 10% margin of error using "Slovin's formula".

Results showed that the overall degree of awareness for Filipino consumers in Guam and in the Philippines were both “moderate”. Consumers agree to most of the statements, but there was an evident disparity of perception on two rights namely information and choose. Filipino consumers in Guam were uncertain in these two rights while Filipino consumers in the Philippines agreed to both rights. Results show significant differences in the degree of awareness between the two consumer groups on the three rights namely basic needs, information, and choose.

Significant difference in the degree of consumers’ awareness was implied in two statements on right to basic needs: Filipino consumers in Guam were not certain if the stores are able to raise the prices of goods and if they can complain if stores do not have the goods they need. Filipino consumers in the Philippines otherwise agreed with both statements. Likewise, significant difference in the degree of consumers’ awareness to right to information was manifested in two statements. Filipino consumers in Guam disagreed that advertisements present the true picture of the products and were not sure that products advertised are generally more dependable.

Filipinos in the Philippines agreed otherwise to both statements. As to right to choose, significant difference in the degree of consumers’ awareness was observed in two statements. Filipino consumers in Guam were uncertain that a wide variety of products makes intelligent buying difficult and if they will choose highly priced goods because they are better in quality. On the other hand, Filipino consumers in the Philippines agreed to both statements.

Apparently, consumers have power and influence in the marketplace yet they should be wary and vigilant. The best protection a consumer has is to be well informed about his rights and responsibilities. Consumers should be ready to secure, protect, and assert their rights in the marketplace while trading and transacting business to obtain fair value at all times. Alongside, consumers have the responsibility to obtain, assess and utilize available information on products and services that will help them make wise buying decision.

This study called for collaborative efforts of all sectors of society to highlight more programs on consumer awareness to build knowledge, competence, values, and skills geared towards the development of an aware and responsible consumer. A consumer education program should be developed as a means to waken or re-awaken the consumers over and over until the message of full awareness on their basic rights is realized. Another study on consumers' constraints in exercising their rights and more study on worldwide basis on consumers awareness to the eight basic rights will not only add value to the literature but will promote empowered consumers.

APPENDICES

Appendix A. Respondents' Profile

	Filipinos in Philippines		Filipinos in Guam		Total	
	No.	%	No.	%	No.	%
Age						
18 -29	175	40%	103	72%	278	48%
30-49	193	44%	26	18%	219	37%
50-above	72	16%	14	10%	86	15%
Total	440	100%	143	100%	583	100%
Gender						
Male	175	40%	66	46%	241	41%
Female	265	60%	77	54%	342	59%
Total	440	100%	143	100%	583	100%
Civil Status						
Single	198	45%	98	69%	296	51%
Married	242	55%	45	30%	287	49%
Total	440	100%	143	100%	583	100%
Educational Attainment						
Completed high school/ Some high school/Some college/vocational	207	47%	89	62%	296	51%
Completed college/Some post graduate/Completed post graduate	233	53%	54	38%	287	49%
Total	440	100%	143	100%	583	100%

Appendix B. Range of Values, Interpretations

Range of Values		Degree of Awareness	Verbal Interpretations	
			Positive Questions	Negative Questions
4.21	5.00	High	Strongly Agree	Strongly disagree
3.41	4.20	Moderate	Agree	Disagree
2.61	3.40	Low	Uncertain	Uncertain
1.81	2.60	Very Low	Disagree	Agree
1.00	1.80	No Awareness	Strongly Disagree	Strongly agree

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CRITICAL SUCCESS FACTORS FOR KNOWLEDGE MANAGEMENT IMPLEMENTATION IN LIFE INSURANCE ENTERPRISES

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ABSTRACT

This study investigates the critical success factors for knowledge management implementation via empirical surveys among Taiwan's life insurance enterprises using structure equation modeling. We find that individual characteristics, knowledge management characteristics and organizational characteristics significantly affect knowledge management implementation. Environments significantly influence knowledge management characteristics and organizational characteristics. Information technology infrastructure significantly affects knowledge management characteristics. This study provides directions for future research and practical implications for the life insurance business in having knowledge management into place.

JEL: D83, M10

KEYWORDS: Critical Success Factor, Knowledge Management, Structural Equation Modeling, Life Insurance

INTRODUCTION

The knowledge spillover engaged in a business or personal relationship with a party in the same or similar industry can often encourage innovative activity (Sarit and Aaron, 2012). The nature of knowledge has been described as "justified true belief" (Nonaka and Takeuchi, 1995). Knowledge, originating from creativity, individual experiences and organizational learning, appears in written documents and in the routines, tasks, processes, rules and values that shape an organization (Bhagat et al., 2002).

Zheng et al. (2010) suggest that practices of knowledge management (KM) are context-specific and can influence organizational effectiveness. Managing knowledge effectively can provide businesses with several competitive advantages, including average level of KM, service quality improvement, cost and time reductions, strengthened relationships among colleagues and quicker knowledge creation (Su and Lin, 2006). Liao et al. (2011) advocate that KM plays an essential role in organizing and utilizing important knowledge available to decision makers wherever and whenever it is necessary. Huang (2011) suggests that the implementation of KM has a positive and significant influence on organizational performance. KM is referred to manage the corporation's knowledge through a specified process for acquiring, organizing, sustaining, applying, sharing and renewing the knowledge of employees to enhance organizational performance and create value (Alavi and Leidner, 2001). In this study, KM is defined as the creation, extraction, transformation and storage of the correct knowledge and information in order to design better insurance policy, modify action and deliver results for both the employees and organizations in the life insurance business (Horwitch and Armacost, 2002).

Critical success factors (CSFs) refer to the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department, or organization (Alazmi and Zairi, 2003; Rockart, 1979). CSFs are the crucial factors or parameters required for ensuring the continued success of an organization (Ranjan and Bhatnagar, 2008). Hsu et al. (2013) propose that CSFs represent those managerial areas that can bring a competitive edge to operational performance. As KM encompasses a wide range of perspectives, the successful implementation of KM is dependent on several critical factors. Stankosky et al. (1999) propose a 4-pillar KM model, in which leadership, organization, technology and organizational learning are identified as the four CSFs for successful KM operation. Leadership is suggested as the most important to drive values for knowledge creation and sharing hence cultivating the business strategy. Organizational structure and culture are necessary to be considered before initiating KM in the workplace. Technology works as a vehicle to allow the flow of knowledge in the organization. Creating a learning community is necessary for promoting any KM initiatives (Stankosky, et al., 1999). McDermott and O'Dell (2001) recommend that the approach, tools and structures to support knowledge sharing should match the style of the organization and networks since the channel of sharing knowledge should be built on the existing networks that people use in their daily work.

The life insurance business in Taiwan has been developing rapidly in the last decades and playing an important role in Taiwan's financial industries. The total asset of the life insurance industry up to 2013 was NT$ 16.5 billion or 28.41% of the total assets of financial institutions in Taiwan. The premium income of Taiwan's life insurance industry in 2012 was US$ 72,521 million and ranked top 9 globally (Taiwan Insurance Institute, 2013). It is important to convey the knowledge and services to the customers via employees and associated departments in the life insurance enterprises, and thus the life insurers should apply KM to accumulate core knowledge, build corporate intelligence and gain competitive advantages (Huang et al. 2011).

Little attention has been paid to address the CSFs for implementing KM in the life insurance sector. Therefore, the research questions are as follows: (i) what are the main factors for KM in the life insurance sector? (ii) what are the primary KM activities in the life insurance sector? and (iii) what are the relationships between these factors and KM activities in this context? To address the research questions, we initially reviewed the literature on KM and relevant empirical studies extensively, and conducted empirical surveys with a preliminary qualitative field study among the life insurance enterprises in Taiwan.

The next section presents the literature review with previous research. The next section presents research methods. Followed are data analysis and results in which measurement model and the structural model assessments are presented. Finally, discussions and conclusion with limitation and future research directions are presented.

LITERATURE REVIEW

The implementation of KM encompasses the managerial efforts in activities of acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups (Zheng et al., 2010). KM processes, including acquisition, conversion, application, and protection, along with a knowledge infrastructure of technology, structure and culture are identified as critical organizational capabilities that would positively and significantly influence the organizational effectiveness (Gold et al., 2001). Shin et al. (2001) propose a KM value chain, consisting of four major activities: knowledge creation, knowledge storage, knowledge distribution and knowledge application. Holsapple and Singh (2001) identify a knowledge chain model which comprises the primary activities, such as acquisition, selection, generation, internalization and externalization, and the secondary activities (e.g., leadership, coordination, control and measurement).

Yang (2004) reports that most of the life insurance enterprises in Taiwan focus on information technology (IT) in implementing KM, and the life insurers should employ the concept and applications of innovation in putting KM into place. Grover (1993) indicates that environment factors (e.g., industry variables and customer demands) influence the adoption of new systems. Industrial and environmental influences are one of the four major determinants in system diffusion (Belassi and Fadlalla, 1998). Holsapple and Joshi (2000) point that, environmental influences, such as fashion, markets, competition, as well as governmental, economic, political, social and educational climate, play important roles in the success of KM in organizations.

Ajzen and Fishbein (1980) indicate that the demographic variables, such as socioeconomic status, education and personality trait, are the external variables of behaviors. Kwon and Zmud (1987) identify individual differences factors, including job tenure, cosmopolitanism, education and role involvement, as the main forces to successfully introduce technological innovations into organizations. Lo (2003) verifies that individual background variables, including age, education, position and tenure, significantly influence the user's satisfaction and performance in Taiwan's life insurance context.

Technology is identified as one of the main infrastructure capabilities in KM as technology can effectively integrate the previously fragmented flows of information and knowledge (Gold et al., 2001). Alavi and Leidner (1999) propose that managers' ascription of KM merge to two IT perspectives: the characteristics of information (e.g., readily accessible information, actionable information and reducing the overload of information) and various information systems, including data mining, data warehouses and decision-making tools. Chiu (2004) suggests that the functional characteristics of the system affects the users' perceived usefulness and perceived ease of use in the life insurance sector.

Davenport (1996) posits that "KM requires knowledge managers" as the high-level principles to manage knowledge effectively. Successful KM programs require motivational schemes and some arm-twisting from senior executives (Davenport and Glaser, 2002). Alavi and Leidner (2001) emphasize that knowledge transfer channels are the focal element in transferring knowledge. Directives (e.g., rules and procedures), organizational routines (e.g., coordination patterns and interaction protocols) and self-contained task teams for solving problems in situations of task uncertainty are proposed to be the three primary mechanisms for knowledge integration to create organizational capability (Grant, 1996).

Rogers (1995) suggests that organizational characteristics, such as size and structure, will influence the innovativeness of an organization. It is crucial that the organizational structures are designed for flexibility so that they encourage sharing and collaborating knowledge across boundaries within organizations (Gold et al., 2001). Although new technologies can be the more efficient means of knowledge creation and transfer, in the absence of an explicit strategy to better create and integrate knowledge, systems which facilitate communication and knowledge sharing have only a random effect at best (Alavi and Leidner, 1999).

Chait (1999) emphasizes that cultural realities act as barriers or enablers for KM. A knowledge-friendly organizational culture is proposed as one of the most important conditions leading to the success of KM initiatives in organizations (Davenport and Prusak, 1998). Gold et al. (2001) signifies that organizational culture could be the most significant hurdle to effective KM. KM projects should have the aim to develop a knowledge-intensive culture by encouraging and aggregating behaviors such as knowledge sharing (as opposed to hoarding) and proactively seeking and offering knowledge (Davenport and Prusak, 1998). Alavi and Leidner (1999) sustain that the culture of teamwork and knowledge sharing is one of the important KM capabilities needed in organizations.

DATA AND METHODOLOGY

This study initially identified the factors and associated variables affecting successful KM based on comprehensive literature review (Huang et al., 2011). The research modified the factors and variables via a qualitative filed study using content analysis (Berg, 2004). A questionnaire was developed based on the literature review and modification from the field study. The instrument items were measured on a seven-point (1-7) Liker scales, in which 1 indicated that the respondent strongly agreed with the statement and 7 indicated that the respondent strongly disagreed with the statement respectively. The questionnaire was pilot tested among 40 employees in a life insurance company and revised to ensure content validity. Finally, this study, via cross-sectional research approach, selected eight life insurance enterprises to be the participant organizations. Finally, this study undertook the main survey to 605 subjects among the life insurance enterprises in Taiwan. The main survey collected 362 valid responses (i.e., a 59.8% effective response rate).

A confirmatory factor analysis (CFA) was performed to specify the structure between observed indicators and latent constructs, and tested the validity of measurement model. Subsequently, structural equations among latent constructs were examined to test the conceptual structural equation model (SEM). The CFA and SEM procedures were conducted utilizing AMOS software.

RESULTS

Table 1 presents the demographic characteristics of the respondents in the main survey. The majority of them were in the age group of 31 to 40; only 0.6% of the respondents were 20 or below, 29.8% in 21 to 30 and 16.3% were over 41. Most of the respondents' educational background was bachelor (57.7%), followed by technical school (23.5%). 59.9% of the respondents had over five year's seniority, in which 21.5% had 5-10 year's seniority and 6.9% had seniority of more than 15 years.

Table 1: Demographic Characteristics

	Characteristics	No.	Percentage
Age	20 or below	2	0.6%
	21-30	108	29.8%
	31-40	192	53%
	41-50	58	16%
	51 or above	1	0.3%
Gender	Male	131	36.2%
	Female	229	63.6%
Seniority	Less than 2 years	77	21.3%
	2+ to 5 years	68	18.8%
	5+ to 10 years	114	31.5%
	10+ to 15 years	78	21.5%
	More than 15 years	25	6.9%
Education	High school	20	5.5%
	Technical school	85	23.5%
	Bachelor	209	57.7%
	Master degree or above	47	13.0%
Position	Office manager	94	23.5%
	Staff	277	76.5%

Table 1 presents the characteristics of the respondents who participated in the main survey. The subjects in the main survey comprised of 36.2% male and 63.6% female. 57.7% of the respondents' educational background was bachelor. Their positions were 23.5% office managers and 76.5% staff respectfully.

This study undertook CFA to confirm the factor loadings of the seven constructs (i.e., environments, individual characteristics, KM characteristics, organizational characteristics, IT infrastructure, cultural factor and KM implementation) and assess the model fit. The model adequacy was assessed by the fit indices suggested by Hair et al. (1998) and Jo¨reskog and So¨rbom (1996). Convergent validity of CFA

results should be supported by item reliability, construct reliability, and average variance extracted (Hair et al., 1998). As presented in Table 2, t-values for all the standardized factor loadings of items are significant ($p < 0.01$). Construct reliability estimates ranged from 0.45 to 0.77, which indicated a satisfactory estimation. The average extracted variances of all constructs ranged between 0.76 and 0.91, which exceeded the suggested value of 0.5. The measurements of these items are summarized in Appendix A. The results indicated that the measurement model had good convergent validity and thus the *proposed measurement model was reliable and meaningful to test the structural relationships among the constructs*.

Table 2: Convergent Validity

Construct	Item	Item reliability	Construct reliability	Average variance extracted
Environments	EI1	0.715	0.4896	0.7926
	EI2	0.763		
	EI3	0.672		
	EI4	0.643		
Individual Characteristics	IN1	0.616	0.5624	0.7916
	IN2	0.821		
	IN3	0.796		
KM Characteristics	KM1	0.807	0.6192	0.89
	KM2	0.754		
	KM3	0.852		
	KM4	0.822		
	KM5	0.689		
Organizational Characteristics	OR1	0.568	0.4477	0.7617
	OR2	0.691		
	OR3	0.78		
	OR4	0.618		
IT Infrastructure	IT1	0.833	0.6952	0.9012
	IT2	0.847		
	IT3	0.823		
	IT4	0.832		
Cultural Factors	CU1	0.835	0.7653	0.9071
	CU2	0.861		
	CU3	0.926		
KM Implementation	KP1	0.818	0.7482	0.8988
	KP2	0.834		
	KP3	0.938		

Table 2 presents the item reliability, construct reliability and average variance extracted of the CFA analysis. It indicates that t-values for all factor loadings of items are significant (p<0.01) and the construct reliability estimates are satisfactory. The average variances extracted are higher than the suggested value of 0.5.

The structural model was estimated with a maximum likelihood estimation method. The fit indices of the structural model are summarized in Table 3. The overall model indicated that $\chi^2 = 688.42$, d.f.=287, and was significant at p <0.001. Technically, the p-value should be greater than 0.05, i.e. statistically insignificant, to indicate that the model well fitted the empirical data. As the χ^2 value is very sensitive to sample size, it frequently results in rejecting a well-fitted model when sample size increases.

Therefore, in practice, the normed χ^2 (i.e. χ^2 /d.f.) has been recommended as a better goodness of fit than the value. In order to examine the model fit, this study used sample size dependent (rather than sample size independent) measures of goodness of fit. The χ^2 /d.f. ratio of less than 5 was used as the common decision rule of an acceptable overall model fit. The normed χ^2 of model was 2.399 (i.e. 688.42/287), indicating an

acceptable fit. Other indicators of goodness of fit were as follows: CFI=0.929, RMSEA=0.062, GFI=0.873, AGFI=0.844, NFI=0.885, NNFI=0.919 and SRMR=0.086.

Table 3: Fit Indices for Measurement and Structural Model

Fit indices	Recommended Value	Measurement Model	Structural Model
x^2/df	<3.0	1.465	2.399
CFI	>0.9	0.978	0.929
RMSEA	<0.08	0.036	0.062
GFI	>0.90	0.924	0.873
AGFI	>0.80	0.903	0.844
NFI	>0.90	0.933	0.885
NNFI	>0.90	0.973	0.919
SRMR	<0.09	0.035	0.086

Table 3 presents the fit indices for measurement model and structural model respectively. The model-fit indices should reach accepted standards before judging model fitness (Hair, et al., 1998). Table 3 shows that every model-fit index exceeds the recommended value proposed by previous studies.

Figure 1: Hypotheses Testing Results

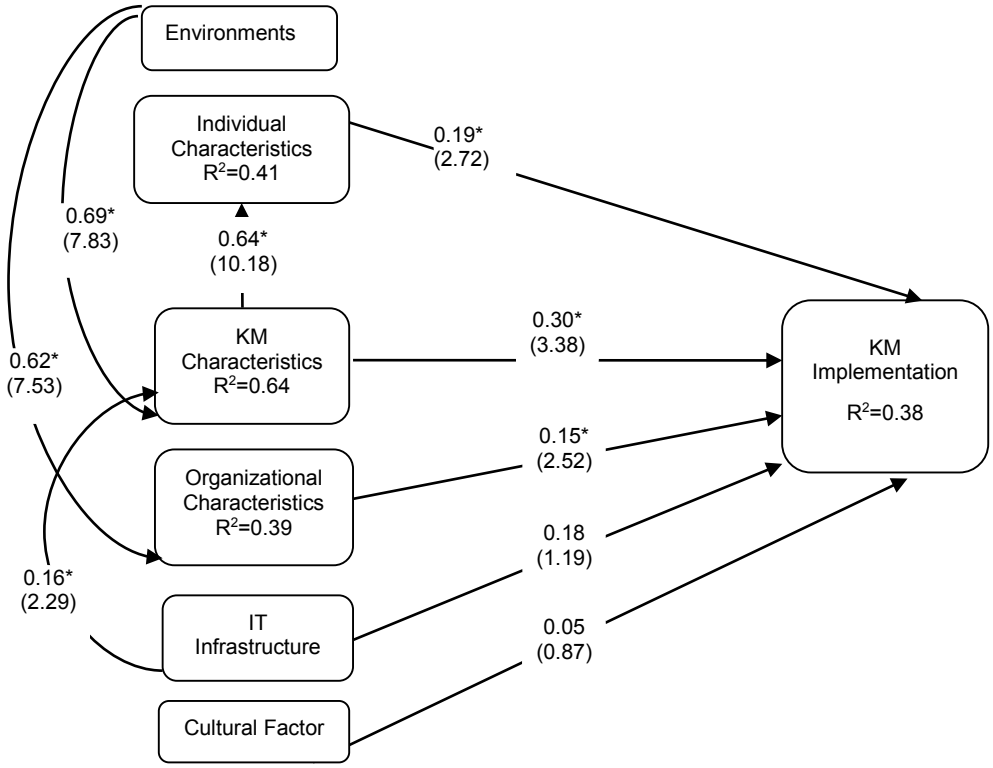

Figure 1 presents the properties of the casual paths, including the standardized path coefficients, path significance and variance explained by each path in the structural model. It is shown that environments significantly influence KM characteristics and organizational characteristics. IT infrastructure significantly affects KM characteristics. Individual characteristics, KM characteristics and organizational characteristics significantly affect KM implementation.

Figure 1 presents details regarding the parameter estimates for the model. Environments significantly affect organizational characteristics (γ1=0.62, t-value=7.53). Environments and IT infrastructure significantly affect KM characteristics (γ2=0.69, t-value=7.83; γ3=0.16, t-value=2.29). KM characteristics have significant effects on individual characteristics (γ4=0.64, t-value=10.18). Individual characteristics, KM characteristics and organizational characteristics significantly influence KM implementation (γ5=0.19, t-value=2.72; γ6=0.30, t-value=3.38; γ7=0.15, t-value=2.52).

The results reveal that individual characteristics, KM characteristics and organizational characteristics have direct effects on KM implementation. It indicates that individual characteristics, such as employees' innovativeness, work attitude and personality, play an important role in KM activities. In employing KM in the life insurance business, it is generally initiated by the organizations via recognizing the needs or problems, developing KM plans or projects, and transmitting the concept and value of KM (Rogers, 1995).

The items identified from the literature and filed study show that, KM schedule and guidelines, participation of the department representatives, knowledge transfer channel and reward of KM are substantial characteristics for successful KM, and KM characteristics are found to have direct effects on KM implementation and individual characteristics. It is also important for the managers to realize that organizational size, structure, strategy and policy have direct impacts on the implementation of KM. However, the impacts of environments on KM implementation are indirect through KM characteristics and organizational characteristics. IT infrastructure, which was identified as one of the main KM capabilities (Gold et al. 2001), indirectly affects KM implementation in this study. It implies that, although IT infrastructure is important in adopting KM, merely the efforts on IT are not enough. The benefits of KM should be well recognized with appropriate KM projects and support from top management.

CONCLUDING COMMENTS

Knowledge management has been recognized to be important in improving adaptability and gaining competitive advantages. However, little research is undertaken examining the CSFs for KM in the life insurance sector. This paper fills this gap via conducting a qualitative field study and quantitative surveys among Taiwan's life insurance enterprises. The collected data from the main survey were analyzed utilizing the techniques of Structural Equation Modeling. The results indicate that individual characteristics, KM characteristics and organizational characteristics have direct impacts on KM implementation. Environments indirectly influence KM implementation via KM characteristics and organizational characteristics. Information technology infrastructure indirectly affects KM implementation through KM characteristics.

This study contributes to the existing literature in that there has been little evidence found in exploring the CSFs and their relationships in affecting KM applications, particularly in the life insurance business. For life insurance enterprises, particularly those embarking on KM in Taiwan or elsewhere, this study presents the essential factors that should be taken into account to put KM into practice successfully.

As with any research, the specific service context and cross-sectional method of this study limit the interpretation of the findings. Some adjustments must be made to apply these results to other industries. However, this study provides directions for future research in exploring the CSFs for KM implementation. A comprehensive model with CSFS for KM and the effects of KM implementation on organizational performance can be investigated in future studies. Generalization of the current study would also need further examination in a broader region such as Asia or in the international setting.

APPENDIX

Appendix A: The Measurements of Items in Seven Constructs

Factor	Items	
Environments	EI1:	Industrial competition
	EI2:	Trend
	EI3:	Rules and regulations
	EI4:	High development of IT
Individual Characteristics	IN1:	Individual innovativeness
	IN2:	Work attitude
	IN3:	Personality
KM Characteristics	KM1:	Time schedule and guidelines
	KM2:	Participation of the department representatives
	KM3:	Knowledge transfer channel
	KM4:	Knowledge type
	KM5:	Reward for KM
Organizational Characteristics	OR1:	Size
	OR2:	Structure
	OR3:	Strategy and policy
	OR4:	Employee turnover rate
IT Infrastructure	IT1:	Software infrastructure
	IT2:	Compatibility
	IT3:	Function
	IT4:	Data updating and maintenance
Cultural Factor	CU1:	Team-work culture
	CU2:	Encouragement of asking for help
	CU3:	Encouragement of interaction with others
KM Implementation	KP1:	Identifying Knowledge
	KP2:	Sharing knowledge
	KP3:	Using knowledge

This table presents the measuring items of seven constructs in the measurement model.

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